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MULSAVITE

Scrotal Enlargements

R. THEODORE BERGMAN*

COLLEGE OF MEDICAL EVANGELISTS, LOS ANGELES

ENLARGEMENT of the scrotal contents is a common condition, and the general practitioner, rather than the specialist, is usually called upon to manage such cases. Most scrotal swellings are innocuous in character and require no immediate attention. However, the more acute conditions may require prompt treatment to avoid serious sequelae, particularly when dealing with conditions such as urinary extravasation and torsion of the cord. Malignancies involving the scrotum and its contents are, fortunately, not common. But, since most testicular tumors are highly malignant, hope of cure must lie in the prompt recognition and proper treatment of these cases. This responsibility rests on the general practitioner, who usually sees the patient first.

Although the enlargement of the scrotum due to a hernia is obviously important, space will not permit its discussion in this article.

HYDROCELE

You will recall that the testicles start as retroperitoneal abdominal organs. On their descent through the inguinal canal into the scrotum, they carry with them a funicular process of peritoneum which normally becomes obliterated. If this process persists after birth, we find abnormalities resulting in a variety of hydroceles. Greene[8] has illustrated in schematic drawings at least eight possible variations. (See Figures 1, 2, and 3.)

Hydroceles may be acquired in type due to injury or disease of the scrotal contents and may be acute or chronic. However, a large majority of hydroceles are idiopathic and not necessarily associated with trauma or other lesions. In acute hydrocele spontaneous reabsorption may take place and there may be no need for treatment.

The accumulation of fluid in the serous sac about the testicles may vary greatly. The average hydrocele sac contains from 2 to 6 ounces of fluid, though much larger amounts of fluid have been removed. Heydenreich removed 10 quarts from a hydrocele and Caforeo reported removing 5 gallons. Hydroceles are not usually of serious significance, although they may be inconvenient due to the restriction of physical activity when they are large. For thirty years the historian Gibbon was so incapacitated by an enormous accumulation of fluid in a hydrocele sac that, to while away his time, he wrote

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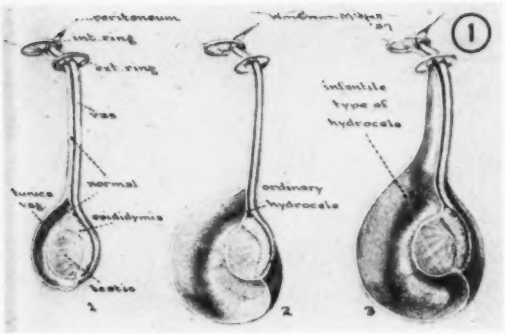
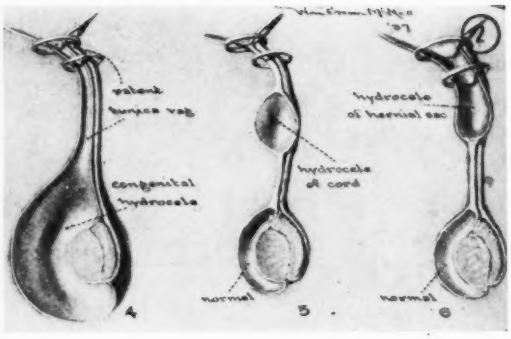




Courtesy, The American Journal of Surgery

Figure 1. The normal relationship of the tunica vaginalis testis.

Figure 2. The simple vaginal hydrocele.

Figure 3. The infantile hydrocele, which is the most frequent variety and is congenital. The processus vaginalis which invests the testicle extends up the cord and is obliterated at the external abdominal ring.

his famous *Decline and Fall of the Roman Empire.*[20]

The diagnosis of hydrocele is readily apparent by the presence of a tense or fluctuant, irreducible enlargement in the scrotal sac, which transilluminates unless the walls of the sac are greatly thickened. The testicle lies posterior to the sac. On aspiration a thin, straw-colored fluid is readily obtained from the sac. Aspiration should never be done, however, unless the possibility of hernia has been definitely ruled out. The occurrence of hydrocele with malignancy is not uncommon and the examiner should be on the alert for this.

When the hydrocele sac is small and nonprogressive in size, active treatment may not be indicated. A large sac is best treated by surgical removal, but palliative relief can be afforded by periodic aspiration when surgery is deemed inadvisable. With a smaller sac, the aspiration of fluid followed by injection of from 2 to 4 cc. of a sclerosing medium, such as quinine and urethane, may prevent its recurrence. Two or three injections may be necessary should fluid again form. Treatments should be repeated every two or three weeks if necessary. Figure 4 demonstrates the effect of sclerosing media one week after its injection. Occasionally an acute epididymo-orchitis may develop during treatment; if this occurs, further injections should be discontinued until the acute inflammation has subsided. Repeated injections will produce a greatly thickened sac wall.

The surgical delivery of the hydrocele sac is greatly simplified if the incision is carried not only through the dartos but also through the three fascial layers as well, until the bluish-green wall of the tunica vaginalis is exposed. The sac can then be readily stripped free, opened, and drained, and the redundant sac excised or inverted over the testicle to prevent recurrence of hydrocele fluid.

A spermatocele may be differentiated from a hydrocele in that the swelling in the former case is usually attached by a narrow pedicle to the upper pole of the epididymis or the rete testes. As the retention cysts communicate with the seminiferous tubules, a milky fluid is ob-

tained on aspiration. After puberty, when spermatogenesis takes place, spermatozoa may be found in the fluid. The treatment is the same as for hydrocele. Both conditions may be present at the same time.

ALTHOUGH rare, splenic rests may be found in the scrotum. The testicles arise from the mesoderm adjoining the mesentery of the midgut. Because of this close approximation it is possible for splenic tissue to be pulled down during the descent of the testicles.[1]

Hematocele is a result of bleeding into the sac of the tunica vaginalis. Injury to the testicle, the epididymis, or the tunica vaginalis may be a factor (Figure 5).

If the swelling is due to hematoma there is a tender, globular mass, dark and ecchymotic, which does not transmit light.

SPURIOUS HEMATOCELE

Histologically the dartos is closely attached to the skin so that its muscular fibers tend to be at right angles to the skin. Consequently, there is a tendency for the skin edges to curl when incised. If the approximation of the skin does not include the dartos and the areolar layer, bleeding from this vascular layer can develop a large scrotal mass. More than one surgeon has been amazed and chagrined, after removing a cyst no larger than a walnut, to examine the site later and find what appeared to be an eggplant in its place.

To avoid this unfortunate surgical sequela, it is particularly important when suturing the scrotum to take deep bites at least 1 cm. from the margin of the incision and incorporate both the skin and dartos in the hemostatic suture. A large hematoma should be opened and the clots removed, the bleeding points ligated, and the wound drained, since long continued pressure on the testicle and cord may result in atrophy of these structures. A spurious hematocele (Figure 6) may occur following a severe blow involving the scrotum or following any surgical procedure on the scrotum in which hemostasis has been inadequate. An attempt to pass a urethral sound for a stricture produced this sequela forty-eight hours later.

R. THEODORE BERGMAN

SCROTAL EDEMA AND ELEPHANTIASIS

Scrotal edema may be a secondary evidence of circulatory decompensation or a result of irritants such as poison oak. So rapidly may this condition develop that the patient may present it as his chief complaint. Because of the loose areolar skin of the scrotum, any reaction in this region leads to disturbances of astonishing proportions. If the edema is great, the penis may literally dissappear into surrounding edematous tissue of the scrotum. Treatment consists of scrotal support and the eradication of etiologic factors.

The huge scrotal mass found in true elephantiasis is rarely seen in this country (Figure 7). This is a disease of tropical or semitropical countries caused by the *filaria bancrofti* invading the regional lymph nodes, producing lymphostasis. Surgical excision of the redun-

dant mass may be necessary for the treatment of this type of scrotal enlargement.

Chronic lymphedema or pseudo-elephantiasis may result following excision of the inguinal nodes, granuloma inguinale, or hernia. The deformity in this condition, however, is not marked and a well-fitting support is usually adequate treatment.

URINARY EXTRAVASATION

Even more serious and more rapidly fatal than the most malignant of testicular tumors can be the condition of urinary extravasation. Injury to the pelvis or perineum may result in a torn urethra with subsequent inability to urinate. As a result, within a few hours tumefaction develops in the perineum and rapidly spreads to the scrotum if the rupture is anterior to the triangular ligament (Figure 8). Colles' fascia limits the advance posteriorly, but the infected extravasated fluid can pass freely anteriorly beneath the dartos of the scrotum and penis and infiltrate the abdominal wall beneath Scarpa's fascia.

An old urethral stricture and an alcoholic debauch may set the stage for tragedy. Insensitive to a distended bladder, the weakened, infected area around an old stricture gives way. Twelve to twenty-four hours later in a toxic, stuporous state, with rapid pulse and high fever, the patient is brought to the hospital. The white count is elevated. At first the scrotum is greatly enlarged and tender to touch. As extravasation of urine progresses, necrosis of tissue appears. Darkened areas on the scrotum become evident because of lack of blood supply due to the pressure of extravasated fluid infected with anaerobic organisms. Instrumentation of the urethra tends to aggravate the condition.

Treatment consists of wide incision of the scrotum and abdominal wall wherever infiltration has occurred. Through and through drainage is important and necrotic tissue should be excised. Hot permanganate soaks, sulfonamides, and penicillin therapy should be administered. Following convalescence plastic surgery may be indicated.

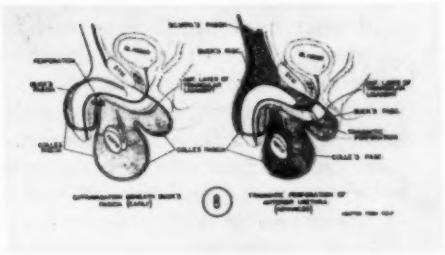
TORSION OF THE CORD

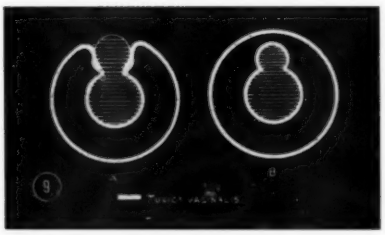
Torsion of the cord is not common. It is, however, extremely important to recognize and treat this condition early. Normally, the testicle is immobilized by the attachment of the tunica vaginalis to the epididymis. Torsion of the cord occurs in patients in whom the testicle, epididymis, and cord are completely surrounded by the tunica vaginalis so that these structures hang unattached posteriorly, and are freely suspended like a bell clapper in the vaginal sac, thus giving the testicle great mobility. (See Figure 9.)

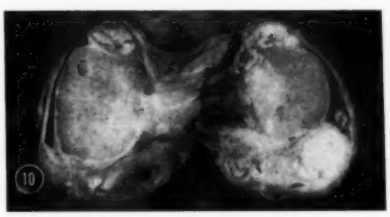
The onset of torsion[18] is characterized by a sudden, acute pain, often following slight effort or trauma. The pain is sharp and varies with the completeness of the twist. The absence of gonorrhea is significant. Nausea and vomiting and occasionally shock may be noted, and symptoms may resemble those of an acute intestinal obstruction. Usually no leukocytosis is present. The urine is clear and the prostate and seminal vesicles are normal, though other pathology can coexist. The testicle is almost horizontal and is elevated as it is drawn toward the inguinal region; it is exquisitely tender. Because of edema, palpation may be unsatisfactory. The epididymis, which normally lies posterior and medial to the testis, may be displaced anteriorly by the torsion. The result is a hemorrhagic infarction of the testicle.

Elevation of the scrotum tends to aggravate rather than relieve the pain of torsion. Treatment is surgical, with removal of the testicle if it is found to be necrotic, and detorsion of the cord and suturing of the testicle to the scrotal septum if necrosis is absent. At the time of surgery, fixation of both testicles should be carried out.

Torsion of the appendix testis may also produce a very painful and disabling condition, which has been increasingly recognized in re-







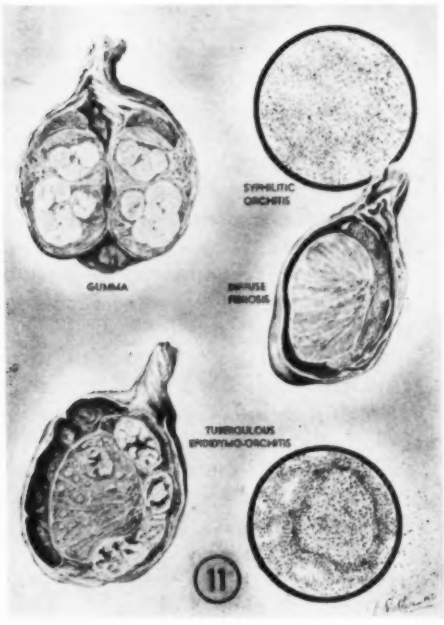


Figure 9 by permission of Surgery, Gynecology and Obstetrics

cent years (i. e., Randall, Fort, Guerin, Hinman, Lamber, McFadden, Rolnick, and Scott). It occurs more frequently in infants and children than in adults. Significant are edema and redness of the scrotum out of all proportion to the size of the lesion itself. When the edema subsides several days following the onset, a pea-sized mass may be palpated at the upper pole of the testis. The relationship between cord and testicle remains unchanged. As in torsion of the cord, treatment should be surgical, and both sides should be operated upon to correct the condition. Removal of the appendages is advised if both pedicles are elongated.

EPIDIDYMITIS

In considering the causes of scrotal swelling, cognizance must be taken of epididymitis. Its classifications are: (1) gonorrheal, (2) nonspecific, and (3) tuberculous.

With the advent of therapy with sulfonamides and penicillin the incidence of gonorrheal epididymitis has been diminished. The sudden onset of acute painful swelling of the epididymis with a history of a urethal discharge and smears positive for gonorrhea is diagnostic. It is an interesting observation that the urethral discharge of gonorrhea ceases with the onset of an acute epididymitis; if the condition is untreated, the discharge will again recur following the subsidence of the epididymitis.

Some difference of opinion exists among urologists regarding the etiologic aspects of non-specific epididymitis. Because of its disabling nature there is considerable loss of time from work. An employee obviously desires to trace the onset of his acute illness to a lift or strain suddenly sustained while at work, so that he can claim compensation to relieve the economic stress suddenly thrust upon him. A man with an infection in his prostate, a bladder full of urine, and a sudden strain certainly has potential causes for an acute epididymitis.

In acute epididymo-orchitis, the scrotum is enlarged, red, shiny, edematous, and extremely tender. The enlarged epididymis at first can be identified but later cannot be palpated until the scrotal swelling subsides. Treatment is chiefly palliative—bed rest, with an ice bag placed under the scrotum to relieve tension on the cord. The daily intravenous administration of 10 cc. of 10 per cent calcium gluconate may promptly reduce associated pain. If suppuration occurs, orchidectomy may be indicated. When the etiology is gonorrheal, sulfathiazole, sulfadiazine, or penicillin therapy should be instituted. If the gonococcal infection remains refractory, fever therapy may be utilized. Prostatic massages and instrumentation are definitely contraindicated during the acute phase.

In tuberculous epididymitis the onset of the swelling is rather obscure. Usually it begins at the lower pole or tail of the epididymis as a hard lump. As the surrounding tissues become invaded, the skin is attacked and becomes immobile over the testicle, and finally breaks down into one or more persistent suppurating sinuses (Figure 10). The induration is usually painless. The vas may be thickened and beaded. Rectal palpation may reveal induration of the prostate and seminal vesicles. The urine may be loaded with pus despite the absence of organisms on a smear culture. Identification of acid-fast organisms confirms the diagnosis, although they may be absent. Repeated searches should be made before a negative report is given.

Since a tuberculous involvement of the genital tract invariably indicates the presence of tuberculosis elsewhere in the body,[28] it is important to recognize the extent and stage of the diseased process before local treatment is instituted. The early removal of an active focus will reduce the morbidity as well as the mortality. Epididymectomy or removal of the mass involved, with transplantation of the vas to the skin to limit sinus tract development, is usually the indicated treatment. Careful postoperative hygiene is essential with emphasis placed on heliotherapy and dietary measures. Thomas and others feel that following the surgical removal of the epididymis or of any other organ containing active tuberculosis, the patient should remain in bed for at least three months at

complete rest, to permit active or undiscovered lesions to become inactive and quiescent.

Acute orchitis is less common than inflammatory conditions affecting the epididymis. Gonococcal and tuberculous organisms commonly affect the epididymis, rarely the testicle. But in syphilis the spirochete usually attacks the testicle (Figure 11) and rarely the epididymis. Acute metastatic orchitis is a complication of many acute infectious diseases, notably mumps and typhoid fever. When an acute painful swelling of the testicle complicates an infectious fever, orchitis must then be suspected.

ATROPHY of the testicles due to orchitis from mumps when both testicles are involved will produce sterility. Weselhoeft and Vose[20] reported in 1942 excellent results with orchiotomy when it was performed promptly in cases of orchitis due to mumps. Epidemics of mumps during the war years among the armed forces have provided opportunities for the clinical study of large numbers of these patients. Burhans,[5] Nixon,[19] Luvix and Pinck[21] have shown that instead of edema of the testicle, an acute hydrocele develops, causing strangulation and inflammatory edema, and that the early incision and drainage of the tunica vaginalis is adequate to prevent pressure necrosis with later atrophy. More recently stilbestrol has been used prophylactically to prevent orchitis from mumps. The prescribed dosage is 2 mg. three times a day after meals, and is administered when the patient first develops a parotid swelling before orchitis has occurred.

In syphilitic orchitis the lesion is indolent in character. A history of syphilis or of a genital sore may exist. The testicles are smoothly enlarged, hard, and insensitive. Both testicles are frequently involved. The epididymis feels normal. These findings, plus a positive Wassermann, help to make the diagnosis. Gumma of the testicle is rarely observed in early life. The surgical removal of a syphilitic testicle may be indicated to avoid the error of leaving a malignant tumor which might be present regardless of a positive Wassermann. The function of a luetic testicle is destroyed even though the swelling subsides under antiluetic treatment.

TESTICULAR TUMORS

Most testicular tumors are malignant, but, fortunately, they are relatively rare. Many classifications of testicular tumors have been made, but for practical purposes, they may be divided into three main groups: (1) seminomas, (2) teratomas, and (3) chorioepitheliomas. Seminomas are the most common and are more radiosensitive than the others. In early cases the prognosis is favorable if promptly and adequately treated.

Clinically, the testicular tumor mass in the scrotum transmits to the examiner's hand a sense of weight not equaled by other scrotal swellings. Squeezing and manipulating a tumor of the scrotum, however, should be avoided as it tends to spread the malignant tumor cells into the lymphatics and blood stream. Early orchidectomy should be carried out if a testicular tumor is suspected. An inguinal approach should first be made dividing the cord high up below the external ring before the removal of the testicular tumor. Should the pathologic examination reveal a benign growth, postoperative radiation is unnecessary. When found to be malignant, thorough radiation including the preaortic nodes should be done.

An interesting and important adjunct in making a diagnosis is the finding of a gonadotropic hormone—prolan A in the urine. If the concentration of this hormone is very high, as in chorioepitheliomas, it signifies a very poor prognosis. If the test is positive during and after treatment metastasis must be suspected.[10]

MULE-SPINNERS' CARCINOMA[3, 4]

Percival Pott, the great London surgeon so well known for his description of tuberculosis of the spine and the common fracture of the ankle, in 1775 described "chimney sweeper's" cancer.[6] In his paper he suggested that the presence of soot in the rugae of the scrotum

might be an etiologic factor. As pointed out by Chase,[6] "The people of the 18th century probably were not remarkable for their habits of cleanliness. When Lady Mary Wortley Montague was remonstrated with because her fingernails were dirty, she replied, 'You should see my toenails.' The anecdote is apocryphal, but significant of the time."[6]

We know today that coal tar is highly carcinogenic and, although the profession of chimney sweeping practically ceased to exist many years ago, carcinoma of the scrotum still occurs among the mule-spinners in the cotton mills. Scott and others[3, 4, 14] have pointed out that these men work in clothes saturated with mineral oils containing carcinogenic hydrocarbons.

Industries that expose their men to prolonged contacts with similar types of lubricating oils, tar, and pitch[14] should offer protection to the worker by periodic examination for any thickening of skin of the scrotum. The skin should be protected by ointment and shorts, and an effort should be made to obtain lubricating oils without carcinogenic properties. It is possible that with our modern detergents and improved habits of cleanliness the danger of skin cancer may be lessened, but we should be on the alert for this condition, the early appearance of which may be deceptive.

I have endeavored to present to you a brief review of scrotal enlargements. Through your alertness the early recognition and successful treatment of many of these conditions may be achieved.

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Respiratory Emergencies

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I WISH merely to call your attention to some very fundamental points often forgotten in the stress and strain of respiratory emergencies. Mistakes of diagnoses in these conditions are often fatal, for a harmful procedure may be initiated. The possibilities should always be considered and, by differentiation and exclusion, the correct diagnosis can usually be made. The basic advice to be given any physician faced with an emergency is to make haste slowly if this is at all possible. Much can be learned by merely looking at the patient. It should be noticed which phase of respiration has been affected—inspiration, expiration, or both and it should be observed whether the individual has cyanosis and air hunger.

A number of conditions ranging from congenital stenosis to miliary tuberculosis can cause expiratory difficulty. We will exclude anoxia of the newborn and pneumonia.

Before considering the various respiratory conditions in detail, I should like to call attention to the mechanical principles involved. With an obstruction in the trachea or large bronchi not sufficient to cause occlusion, there may be wheezing on inspiration and expiration, the mechanical effect of a by-pass valve; the patient may have wheezing on inspiration and extreme difficulty on expiration, a check valve effect; or a stop valve effect with stoppage of ingress or egress of air, with complications like emphysema, obstruction, atelectasis, and so on.

In an adult a small amount of moisture in the distal small bronchi may be of little importance, while the same slight inflammatory reaction may cause distressing symptoms in an infant. The finer bronchials are affected in the same way as previously mentioned; whether there is a foreign body or simple edema, the mechanical effects are similar, namely, a by-pass valve effect with wheezing, a check valve action with perhaps wheezing inspiration and no expiration with complicating emphysema, and a stop valve action with total obstruction and complicating atelectasis.

Glands situated external to the bronchi may be swollen, and inward pressure may cause the same types of respiratory obstruction. They may empty into the bronchi and cause necrosis of the wall.

Congenital laryngeal stenosis is readily apparent. It may range all the way from partial to complete stenosis and when it is the latter, the patient usually dies shortly after birth. Frequently, obstruction is incomplete, but when

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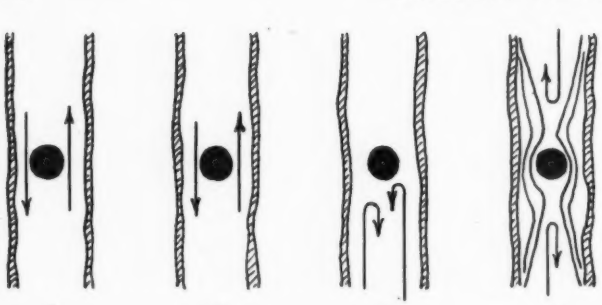

A. Bypass valve showing ingress and egress. B. and C. Check valve; B shows ingress only; C, egress stopped. D. Stop valve, ingress and egress stopped.

Left. Bypass valve, wheeze. Center. Check valve; (center, left) expiration in emphysema; (center, right) inspiration in emphysema. Right. Stop valve, atelectasis.

severe there is crowing on inspiration and expiration and there may be no cyanosis. A slight degree of occlusion may even be missed. Even more extensive occlusion does not cause death directly, but it may do so indirectly by its effect on the circulation. The treatment employed in these cases is gradual dilatation done by the otolaryngologist.

Congenital stridor of the newborn is not an unusual condition. Mild cases are extremely common and are frequently missed or ignored. When the patient has difficulty in breathing, inspiratory and expiratory crowing, choking spells, and attacks of cyanosis and air hunger, often precipitated by feeding, the mother becomes alarmed. Every pediatrician has seen many such cases. They should be termed patients with "inspiratory laryngeal collapse," since this terminology gives a better picture of the actual condition. The majority of these infants survive in spite of the fact that they give everyone great concern. The physician or mother soon learns the position in which the infant will breathe less noisily and with little effort; they also learn the positions in which the child has so much difficulty in breathing that the chest sinks in with each attempt at inspiration. The patient may have a mild convulsive seizure if he remains in such a position. If the tongue is pulled forward the infant will breathe more comfortably. The physician must test the infant in all sorts of positions, sitting up, lying on his stomach, and so on. He may have to employ tube feeding for even if the obstruction is very severe, the child will usually survive if he can be fed.

If the child weathers the storm for a month or so, the chances are that when he begins to move his head, he will develop enough muscle strength to bring his neck forward and the condition will gradually disappear. In some instances, however, it has been necessary to remove a v-shaped wedge from the epiglottis. I have never had recourse to this procedure, since I have never had a patient whom I could not place in a position where he could breathe relatively comfortably. Some clinicians recommend tracheotomy if the child has severe difficulty.

Macroglossia and glossoptosis may be considered together. The former is common in Mongolian idiots, although it may be present in other children. The child cannot breathe in certain positions without swallowing his tongue, at which times he has marked inspiratory difficulty and snorting respiratory effort. Only during attacks will there be cyanosis. Simple changes of position relieve the condition. It makes little difference whether a child snorts or not when breathing or how much noise he makes. The significant factor is that he get air exchange and if he does, no operative interference is necessary.

Glossoptosis is not likely to cause much difficulty unless the patient is being anesthetized, during the course of which the tongue may be swallowed. This may also happen during sleep and again simple change of position or pulling the tongue forward brings relief.

Edema of the glottis is a common condition. It may occur suddenly in infants and children with a history of previous sensitivity, or when offending antigens such as tomatoes or strawberries are ingested. It may occur after the local application of drugs to the throat, in cocainization, etc. It occurs more commonly after an acute throat infection. Usually the child complains of a sore throat for some time. In some instances he will start to have respiratory difficulty, which though extraordinarily severe, is almost always present on inspiration. Occasionally it may extend down into the larynx causing edema there (especially with influenzal infections) with trouble on expiration also. The attempt to inhale air will be distressing and

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there is sinking of the chest wall and the use of all the accessory muscles. There may be no cyanosis at first, but later, with the completeness of the edema and the totality of the obstruction, there is air hunger with cyanosis. In most instances there is no cyanosis, but merely aggravated difficult inspiration and medical means should be employed before any operative interference is employed. When a Whitehead gag is placed in the mouth the edematous glottis can easily be palpated and when the finger brings the edematous glottis forward, air exchange becomes easy.

In a condition like this, there is only one thing to do if the situation has become an emergency and that is to perform a low tracheotomy. Before doing a tracheotomy, however, it must be remembered that a tracheotomy may possibly be avoided by giving morphine, by steam inhalations, and so on. If a tracheotomy is necessary, the wound must not be sutured around the tube. It should be left open to avoid

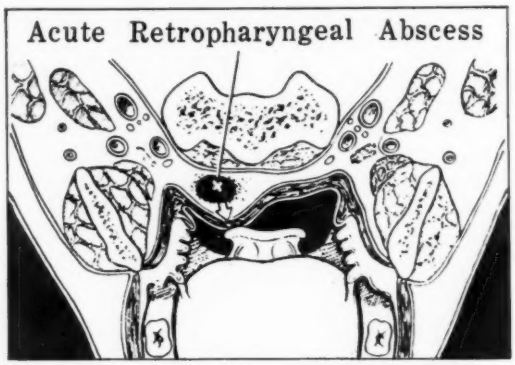
air getting into the mediastinum. It makes no difference whether air bubbles in or out.

Under the laryngeal conditions are included a number of entities which have separate origins but which create the same type of mechanical respiratory obstruction. Usually papillomas are not recognized, although from the history and the hoarse voice, one may suspect some pathologic condition, such as polyp, hemangioma, or cyst. Anyone with a hoarse voice who coughs blood from the larynx and shows no other indications of disease should be investigated immediately. A diphtheritic membrane is an obstructive agent but the obstruction is more gradual in onset. The obstructing membrane can be seen and felt, and obstruction is present both on inspiration and expiration. It is associated with varying degrees of air hunger and cyanosis, depending on its size, sometimes with a mild fever or no fever at all, and a pulse out of all proportion to the temperature. If we deal with pure laryngeal diphtheria only, an intubation is easy.

If the laryngeal diphtheria is complicated by nasal diphtheria or an edematous throat, a low tracheotomy is the method of choice. It may be mentioned that a membrane never becomes large enough in an adult to occlude the larynx and if he has difficulty in respiration it is because the membrane has extended downwards, covering the tracheal and the bronchial walls down to the small bronchi. As a consequence the patient has marked dyspnea and cyanosis, air hunger, and difficulty in breathing, both on inspiration and expiration. Surgical procedures are not warranted in such cases. The thing to do is to give him plenty of morphine, plenty of antitoxin, and to treat him with scientific neglect.

LARYNGEAL conditions are usually not emergencies unless a cyst or polyp has become large enough to occlude the air passages. It is most unusual for these patients not to show previous signs of respiratory modification. Hemangiomas usually resemble polyps, but may break and bleed. Simple laryngeal edema may occur during the course of an infectious disease such as measles and influenza.

I need not mention reactions to corrosive substances. If the patient lives and survives the acute edema, he may gradually get better only to become worse as cicatricial contractions are formed. The need for treatment by gradual dilatation by a laryngologist is so obvious that little need be said about it.



A retropharyngeal abscess is an interesting condition. There are two types, hot and cold. The latter comes from the vertebrae and is accompanied by constitutional and local symptoms long before the presence of an abscess is noted. The acute hot abscess is found either to the right or left of the mid-pharynx and can be diagnosed by inspection. The patient adopts the typical bronchoscopic position and as the abscess gets larger he begins to have inspiratory difficulty with crowing. If the abscess gets large enough, the crowing also occurs on expiration. Paradoxically, although the patient will have air hunger and marked difficulty in respiration, he will not have cyanosis. If a Whitehead mouth gag is used, a finger carefully swept over the pharynx will confirm the diagnosis.

A foreign body may present difficulties. A diphtheria membrane is actually a foreign body, a granulomatous-like lesion which builds up on top of the tissue. This has already been dis-

cussed, however. Sometimes a foreign body like a wood splinter or toothpick may lodge in the larynx causing localized edema. If it is high in the larynx and surrounded by edema, a tracheotomy should be done and the object removed. The usual objects are metallic toys, peanuts, grains, or popcorn. Legumes ordinarily do not create an emergency because material such as peanuts usually lodges in the small bronchial tubes, swells and moisture and occludes the tubes, distal to which there may be infection. Pneumonitis may occur and there may be possible multiple abscess formation associated with a septic type of temperature curve.

Caseous glands do not create an acute emergency unless they occlude or rupture in the trachea. Usually long before rupture occurs, there is irritation of the recurrent laryngeal nerve with marked coughing. If the gland breaks into the trachea a large amount of pus may be coughed out or insufflated. Other conditions that occur about the trachea, such as aneurysms, tumors, and lymphomas are rarely emergencies. They are slow in growing and can usually be diagnosed by x-ray.

Laryngismus stridulus (laryngospasm) and spasmodic croup (stridulous laryngitis, false croup) can be considered together. Here the history is most important. In the latter instance there is a history of recurrent attacks most frequently at night, attacks which occur suddenly without any previous warning, and cease as soon as ipecac is given. These attacks may be associated with all types of minor respiratory infections. The distress is severe in both phases of respiration with air hunger, cyanosis, and so on. In the former, there is lack of fever, sudden onset, periods of tetany, and apnea ending in an inspiratory crow.

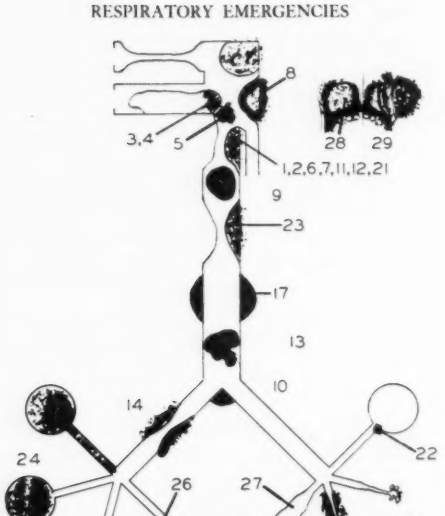
THE condition which most concerns pediatricians is acute laryngotracheobronchitis. This type of infection is rarely appreciated by our medical confreres. The symptoms may be mild in an adult compared to those in an infant with the same type of infection or disturbance in the same portion of the respiratory tree. This condition occurs in infants who at first merely have a running nose, a serous discharge which is not coughed out. Often the secretion is insufflated down the tracheal tree and enough becomes inspissated to the point where it occludes the lumen. Extreme inspiratory and expiratory difficulty and marked cyanosis follow. These children need not be operated on at once. The effect of ordinary steam and some barbiturate should be tried first. Morphine is contraindicated in most clinics. If this therapy does not have a reasonable effect, a bronchoscopic examination must be done and the material removed from the tracheal tree. Often this must be repeated again and again before the patient recovers. The wise physician, however, learns to avoid this condition by changing the position frequently whenever an infant gets a running nose by placing him in a draining position and also in a moist atmosphere.

I included hilar pneumonia since it is a startling entity, one associated with marked inspiratory difficulty, cyanosis, and air hunger, which may be guessed but rarely accurately diagnosed except by careful roentgenologic examination.

Capillary bronchitis, bronchiolitis and mediastinal tumor, pathology of the thymus, and asthma are included for the sake of completion, but they rarely offer any difficulty. The question as to whether a thymus can cause respiratory trouble cannot be settled by me. Whether there is such a thing as status thymus lymphaticus is debatable. I need only mention whooping cough with its attendant inspiratory difficulties.

Respiratory emergencies with neurologic lesions have long intrigued me. There may be an upper motor neuron lesion of the nerves supplying the laryngeal muscle. Sometimes the lesion so cortically located may give an irritative type of phenomenon, the patient having spasms of the respiratory muscles as in rabies and tetanus, or spasms with apnea which may become prolonged until the patient eventually dies of suffocation. About the only therapy that can be employed in rabies is morphine. Pro-

RESPIRATORY EMERGENCIES



1. Congenital stenosis and anomalies
2. Inspiratory laryngeal collapse, congenital stridor of newborn
3. Glossoptosis
4. Macroglossia
5. Edema glottis
6. Laryngeal papilloma:
   A. Congenital or acquired
   B. Cyst
   C. Hemangioma
   D. Polyp
   E. Diphtheritic
   F. Edema
7. Laryngeal reaction to corrosive substance
8. Retropharyngeal abscess:
   A. Hot
   B. Cold
9. Foreign body:
   A. Metallic object
   B. Matter which swells
10. Caseous gland into trachea
11. Laryngismus stridulus—laryngospasm
12. Spasmodic croup
13. Laryngotracheobronchitis
14. Hilar pneumonia
15. Capillary bronchitis
16. Bronchiolitis fibrosa obliterans
17. Mediastinal tumor (teratoma, etc.)
18. Thymus
19. Asthma
20. Whooping cough
21. Poliomyelitis
22. Miliary tuberculosis

found sedation is the most successful therapy for tetanus.

Respiratory difficulties are present also in infantile paralysis. There is the individual who begins to talk thick; he is unable to enunciate syllables correctly, consonants especially; he cannot swallow too well and fluids may back up through his nose when he lies down, but not when he sits up; mucus collects in his throat and he has difficulty in coughing out this mucus as a consequence of which the posterior pharynx is filled. He finds by experience that if he breathes shallowly he may not have an irritative cough and that the mucus will not irritate him. He does this for a half dozen or more respiratory efforts until he reaches the point where he has an absolute necessity for a deep breath. He takes a deep breath and the mucus that he cannot cough out is insufflated; he goes into a respiratory tailspin and actually may drown in his own secretion unless something is done. This is the individual with a true bulbar involvement where there is no need for a respirator. All that needs to be done is to place the patient's head laterally in a dependent position, so that his throat is drained by gravity and the mucus is aspirated with an electrical aspirator; soon the patient will be breathing normally. These types of cases have been miraculously cured by various forms and methods of therapy. Any kind of a miracle cure may be tried, but remember the aspirator, remember to put the patient in a dependent position so that he drains well, and remember not to put him in the respirator.

The second type of infantile paralysis patient with respiratory difficulty is the one who has paralysis of the intercostal muscles and perhaps the diaphragm. He cannot inhale, and unless immediate aid is given him, he will suffocate. This is the patient who must be placed in a respirator, often called an "iron lung."

There is a point I would like to make in closing. In spite of the police department, the fire department, and any other department that has created a consumer demand for pulmotors, think twice before you use them. The only place where these instruments are of value is in electrical shock or in drowning, and even then, the oldfashioned methods are better.

The last point that I would like to stress is that in any respiratory emergency, unless the individual is in dire stress and the next breath may be his last, stop, look, and listen and make haste slowly.

Recent Advances in Treatment of Malaria

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RECENT advances in the control and treatment of the malarias include not only the development of new antimalarials but the collection of information on the natural history of the malarias which now permit more effective treatment. These advances are so interwoven that it would be unwise to discuss one and not the other.

The original belief that sporozoites from an infected mosquito enter red blood cells directly is no longer tenable. Huff and his coworkers have demonstrated that the sporozoites of certain of the avian malarias first enter fixed tissue cells. Shortly thereafter they undergo a developmental phase characterized by more than a single cycle, with re-invasion of other similar cells. This phase of the disease is now commonly called the primary tissue phase. After several such cycles, forms of the parasite capable of invading and growing in the red blood cells develop and initiate an erythrocytic phase of the disease. The parasites of both the primary tissue and the erythrocytic phases may then continue their cycles until such time as adequate antimalarial therapy is instituted or death ensues. Other aspects of the biology of the avian infections need not concern us today. The search for parasites of a similar primary tissue phase of malaria in man has not been wholly successful. However, there is sufficient evidence to make the existence of such forms almost certain.

Accepting such a premise, it is possible to portray the underlying biology of vivax and falciparum malaria in a simple fashion. As indicated in Figure 1, it is believed that vivax sporozoites enter fixed tissue cells and initiate the tissue phase, which in itself causes no signs or symptoms of disease but which may persist for as long as three years. From time to time, parasite forms capable of invading red blood cells are developed from this tissue phase. These initiate the erythrocytic cycles that are responsible for the clinical attacks of malaria. By a process of cell differentiation, the asexual parasites of the erythrocytic phase give rise to the male and female gametocytes which also remain in the red blood cells. The gametocytes undergo no further development unless they are taken into the stomach of an anopheline mosquito.

It is of special importance to understand the differences between vivax and falciparum ma-

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laria. As noted above, the persisting tissue phase of vivax malaria can give rise to new lines of erythrocytic forms. These are responsible for the relapses in vivax malaria, each of which may occur as a discrete episode in the disease. This is apparently not true in the case of falciparum malaria, the mechanism of which is outlined in Figure 2.

In the falciparum infection, the tissue phase of the disease does not seem to persist far beyond the establishment of the erythrocytic phase of the disease. Continuation of the infection depends solely on the persistence of this erythrocytic phase. There would appear to be, then, a fundamental difference between the underlying mechanisms in the two infections, and this is taken to be the factor responsible for their different responses to therapy.

Adequate *prophylactic* treatment, using the drugs that destroy or prevent the further development of the sporozoites or the parasites of the primary tissue phase will, of course, eliminate all subsequent phases of the disease. Effective *curative* treatment eradicates the later tissue phase characteristic of vivax malaria, and, if at the same time the erythrocytic parasites are destroyed by a suppressive drug, there will be no further evidence of malaria.

THE situation when using only *suppressive* drugs in vivax malaria is quite different. Such drugs rapidly eliminate the erythrocytic parasites and, so long as adequate amounts of these drugs are administered, there will be no clinical disease. However, in spite of continued therapy it is possible to demonstrate the periodic presence of parasites in the blood. This is because parasites of the tissue phase are not affected by suppressive therapy and they continue their cycle. After suppressive therapy is discontinued, and as soon as the drug has disappeared from the blood, parasites which have been invading the erythrocytes at periodic intervals have the opportunity to multiply and cause a clinical relapse.

The clinical response of falciparum malaria to drugs differs from vivax presumably because of the more limited duration of the tissue phase of the disease, as indicated in Figure 2. Effective suppressive treatment of falciparum malaria, if continued well beyond the period of exposure or at the time of the clinical attack, will result in cure of the disease. It should be emphasized that adequately treated falciparum malaria never relapses.

Too little is known of the biology of quartan and ovale malaria to permit a similar interpretative analysis of their underlying mechanisms.

It is apparent, then, that the clinical course of malaria in an individual will be conditioned in a definitive manner by the species of plasmodium involved. It is not commonly recognized, however, that different strains have different life histories in the human host, are characterized by different immunologic responses, and respond differently to therapy.

It will be recalled that the tissue parasites of vivax malaria periodically develop forms capable of invading the erythrocytes and initiating the cycle of development which is responsible

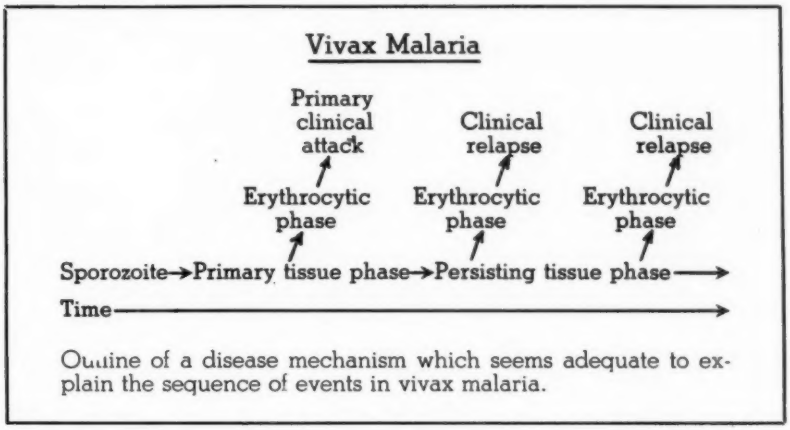


Figure 1. Outline of a disease mechanism which seems adequate to explain the sequence of events in vivax malaria.

for the clinical attack. The liberation of these forms is not a continuous process. It is now recognized that each strain of vivax malaria has its own characteristic pattern of periodicity. Infections due to several strains of *P. vivax* originating in the United States are characterized by a period of latency which lasts some six to ten months following the initial clinical attack, whereupon several relapses usually occur during the subsequent three or four months (Figure 3). However, with vivax strains derived from certain tropical areas, this long period of latency between the primary attack and the first relapse is unusual (Figure 4). The characteristic pattern in the latter instance is one wherein relapses occur at short intervals.

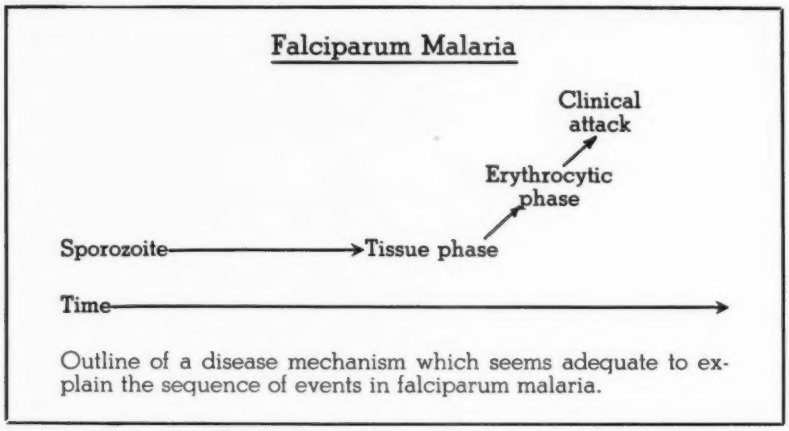
There also appears to be a marked variation in the response of the erythrocytic phase of the disease when due to different strains of a species. This variation is as great as is seen when one compares the chemotherapeutic response of the disease when due to different species. This is striking in the case of certain strains of falciparum, such as the Roman strains described by Sinton, and the Costa strain, the erythrocytic forms of which are quite resistant to the action of quinine.

The number of vivax sporozoites deposited at the time of the infection is also of consequence to the course of the disease in the individual. The initial density of tissue parasites is probably proportional to the number of sporozoites injected. Consequently, the higher the density of these parasites, the shorter—within certain limits—is the incubation period, the more frequent the relapses in vivax malaria when purely suppressive drugs are utilized, and the more chances there are of a relapse after a given course of curative treatment. With the passage of time, the vivax tissue parasites gradually diminish in number and may eventually disappear. This is reflected by less frequent relapses when simple suppressive drugs are used and by a better response to curative drugs.

Lastly, immunologic factors modify the course of a malarial infection. The longer a particular attack of malaria has lasted in a patient before the institution of treatment, the less drug required for a favorable therapeutic result. Similarly, relapses respond better than does the initial primary attack.

TYPES OF ANTIMALARIAL TREATMENT

The various types of therapy that can be utilized for the treatment of patients with vivax and falciparum malaria and effective drugs within each category may now be considered on a reasonable basis.



Outline of a disease mechanism which seems adequate to explain the sequence of events in falciparum malaria.

Figure 2.

Prophylaxis—Malarial prophylaxis not only prevents the acquisition of a patent infection by an individual, but, in addition, prevents the further transmission of the malaria to mosquitoes. At first sight, this might seem to be the ideal type of antimalarial therapy. However, it must be realized that such treatment alone, to be effective, must be continued without interruption for as long as an individual remains in endemic malaria regions. Otherwise, protection is apt to be uncertain and incomplete.

However high the order of activity of a truly prophylactic agent, the lack of its action for as short a period of time as one week is sufficient for an individual to contract a malarial infection. If the prophylactic agent is not, in addition, an effective suppressive, then the patient will be subject to a clinical attack. Pentaquine and pamaquine, both 8-aminoquinolines, are prophylactic drugs. However, the dosage of these drugs required to produce such an effect is too large for them to be considered practical prophylactics. In addition, their lack of a high degree of suppressive activity would preclude their use for prophylaxis, even were they not so toxic.

The high degree of prophylactic action of chlorguanide in falciparum malaria, its partial prophylactic action in vivax malaria, and the highly effective manner by which it suppresses both, suggest that it may well be considered for prophylactic therapy. Low dosage administered for this purpose will prevent falciparum malaria and, if doses are missed so that an infection is acquired, it will suppress the clinical manifestations of the disease and eventually effect a cure. The partial prophylactic action of the drug in vivax malaria, i.e., its ability to delay the establishment of the erythrocytic phase, and the high degree of effectiveness it has as a suppressive for vivax malaria, permits complete freedom from the clinical manifestations of the disease during continued therapy. A dosage which should achieve such a purpose in the ordinary adult is 0.25 gm. of chlorguanide (base) once weekly. However, the primary value of the drug, when used generally for such a purpose, stems from its high degree of suppressive action as discussed below.

TABLE 1

Drug	Adult Suppressive Dosage
Quinacrine	0.1 gm. daily
Chloroquine	0.25 gm. once weekly
Chlorguanide	0.25 gm. once weekly

Suppression—Routine suppression of malaria can be accomplished by any one of several drugs, as shown in Table 1.

This aspect of the treatment of malaria re-

TABLE 2

Drug	Vivax	Falciparum
Quinacrine	0.2 gm. at 4-hour intervals for 4 doses; then 0.1 gm. t.i.d. for 6 days	Same
Chloroquine	0.25 gm. at 12-hour intervals for 5 or 6 doses	Same
Chlorguanide	0.25 gm. at 12-hour intervals for 2 or 3 doses	0.25 gm. at 12-hour intervals for 2 doses; then 0.25 gm. daily for 9 days

quires some extended comment. The purpose of suppressive therapy is to impair the ability of parasites of the erythrocytic phase to reproduce themselves and so increase in number as to be able to evoke clinical symptoms of the underlying disease. In falciparum malaria, the continuation of suppressive therapy on any one of the above regimens should result in fairly prompt cure of the disease if, at the same time, the individual is removed from the hazard of a further infection. In vivax malaria, as pointed out earlier, this is not the case and relapses are to be expected, the number and time of occurrence being dependent upon the strain of the offending organism, the density of the initial infection, and the time during the course of the disease that treatment is terminated.

Specific indications for the use of suppressive therapy are: (1) during periods of exposure and for some four weeks thereafter; (2) following a clinical attack if general debility exists, and (3) before, during, and after any medical, surgical, or obstetrical crisis if an individual is known to have an underlying vivax infection.

Thus, suppressive therapy most generally is used to carry an individual during a period when medical disability would be highly disadvantageous to him. For this purpose, chlorguanide and chloroquine are the drugs of choice, but a selection between these two is difficult and perhaps unimportant, since both can be expected to be highly effective when properly used. The observations of Packer with specific strains of vivax and falciparum would appear to weigh the balance in favor of chlorguanide, as would the fact that it does possess a prophylactic action. This undoubtedly enhances its effect as a practical suppressive. However, until more precise information is available on the relative effectiveness of these two agents in many areas of the world, no final decision on their relative value can be reached.

Treatment of clinical attack—Termination of a clinical attack of vivax or falciparum malaria can be accomplished by the use of these same drugs, as shown in Table 2.

It will be seen from a consideration of these dosages that the advantages of chloroquine and chlorguanide over quinacrine when used in the treatment of vivax malaria include a shorter period of therapy and less frequent drug administration. These advantages are made possible by the lesser toxicity of these two agents as compared to quinacrine and by their higher antimalarial activity. The same dosage schedules may be used for the treatment of falciparum malaria with the exception that with this infection chlorguanide must be administered for a longer period of time.

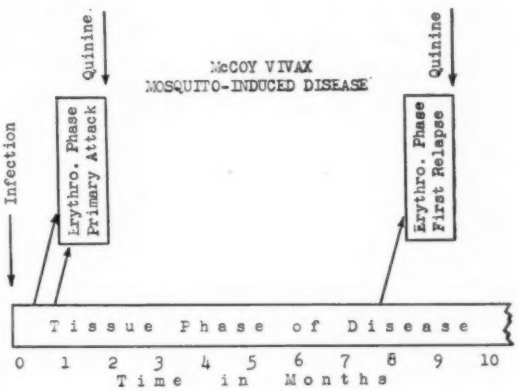


Figure 3.

Any one of the above dosage regimens will probably constitute adequate therapy for use in the treatment of a clinical attack. I say "probably" advisedly. Neither chloroquine nor chlorguanide has been used extensively enough for one to know the influence of the varying susceptibilities of different strains of vivax and falciparum malaria upon the response to these

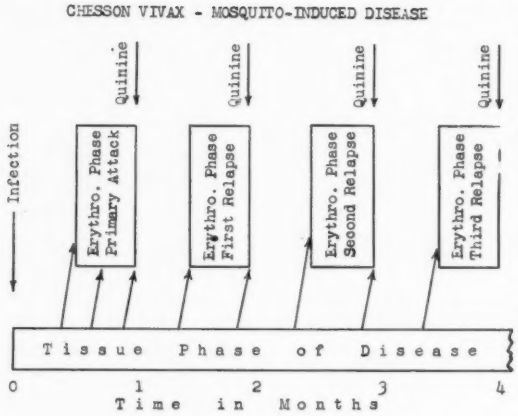


Figure 4.

drugs and to these suggested dosage regimens. We do have sufficient information to know predictions should be made with caution. For example, in the case of vivax malaria treated with chlorguanide it has been demonstrated that minute doses of this potent drug can terminate clinical attacks and that, in general, the response has been as fast as the response to high doses of quinacrine. Yet the Chesson strain of vivax malaria responds quite slowly, requiring some four to five days for the temperature to return to normal in some patients.

Again, in the case of a specific quinine-resistant strain of falciparum malaria, i.e., the Costa strain, we find a similar resistance to chlorguanide, not to the prophylactic action, but in terms of the ability of the drug to terminate a clinical attack. Certainly these facts argue against the use of chlorguanide in the termination of the clinical attack. On the other hand, I have just received information from Avery working in Iran that with chloroquine he frequently finds the drug must be administered for as long as five to seven days before he obtains clearance of the parasitemia.

These evidences of variation of strain susceptibility create a situation wherein it can only be accepted that, generally speaking, both drugs are highly effective, neither one has been fully established with respect to its potentials and its limitations and if an unsatisfactory result is obtained with one drug, then the course of therapy can be repeated or the other drug used. The latter suggestion stems from the fact that up until the present time no strain has been described which is peculiarly resistant to both drugs.

Curative therapy—Some years ago, Sinton obtained evidence that the concurrent administration of quinine and pamaquine for two or more weeks reduced the incidence of relapses in vivax malaria. During the recent war, confirmation of this was obtained both in England and in the United States. The latter studies demonstrated that pamaquine alone has some curative action in vivax malaria when given in high doses, but that this action is potentiated by quinine. Quinacrine, chloroquine, chlorguanide, and a number of other new synthetics do not possess this property.

It was further found in confirmation of earlier studies that pamaquine and quinine should be given for a ten-fourteen day period for best results. Shorter periods of drug administration or relatively low dosages, although not generally curative, do apparently reduce the number of tissue parasites so that the subsequent latent period is prolonged and the future relapses are easier to cure.

CURATIVE THERAPY

	Primary Attacks	Relapses
Pamaquine	90 mg. with 2.0 gm. quinine for 14 days	30 mg. with 2.0 gm. quinine for 14 days
Pentaquine	60 mg. with 2.0 gm. quinine for 14 days	30 mg. with 2.0 gm. quinine for 14 days

The density of the vivax sporozoite inoculum, the total duration of the infection prior to curative treatment, and the characteristics of the strain of malaria under consideration as previously noted are all important factors in determining the amount of pamaquine required to achieve a cure. Thus, it has been found that 90 mgm. of pamaquine (base) and 2 gm. of quinine sulphate must be administered in divided doses each day for fourteen days to cure relapsing vivax malaria induced experimentally by heavy sporozoite inocula. In contrast, 95 per cent of soldiers with relapsing

vivax malaria of one or more years total duration have been cured on a similar regimen but in which the daily dosage of pamaquine was reduced to 30 mgm.

It is well known that pamaquine therapy is attended by several side reactions. On dosage regimens of 90 mg. daily, these are extremely unpleasant, but at 30 mgm. daily, the incidence of such symptoms is not great nor are the reactions usually of any serious consequence. Abdominal discomfort or pain, leukopenia, and methemoglobinemia are the commonest findings, but these rarely require the termination of therapy. However, occasional patients receiving pamaquine develop an acute hemolytic anemia characterized by hemoglobinuria and shock. This is more common among dark-skinned individuals than among Caucasians. The anemia usually begins on the second to the fourth day of therapy, and when it occurs is an acute medical emergency, though prompt cessation of drug administration and blood transfusions, if indicated, do readily control the situation.

In view of these side reactions it is advisable to admit patients to the hospital for the curative treatment by pamaquine.

More recently, another 8-aminoquinoline, pentaquine, has been developed. Pentaquine is effective as a curative antimalarial in combination with quinine and is attended by a relatively low incidence of side reactions. Few instances of abdominal cramps have been noted among persons taking curative doses of pentaquine; methemoglobinemia is minimal, and leukopenia rare, as is the true acute hemolytic anemia. The latter has been noted in three instances. Nonetheless it is also advisable to have pentaquine-treated patients under close medical supervision, at least until our clinical experience with this drug is more extensive. Other 8-aminoquinolines with significant advantages over pentaquine would appear to be forthcoming from the present U.S.P.H.S. program, but these are not far enough along to warrant discussion here.

The permanent eradication of relapsing vivax malaria from individuals who leave endemic for non-malarious regions is the chief value of the curative treatments now available. It may also be desired by persons residing in only slightly or moderately malarious regions and who have reason to believe that the chance of new infections is not likely to be great. There is, of course, little purpose in administering present curative therapy to persons who are frequently exposed to malaria infections.

THE problem of cure of falciparum malaria is not complicated, for all that is required is adequate treatment of the clinical attack or the continuation of suppressive therapy with quinacrine, chloroquine, or chlorguanide, preferably for four weeks beyond the time of last exposure to possibly infected mosquitoes.

Gametocidal treatment—The elimination of gametocytes from the blood of a patient with malaria has no effect on the clinical status of the individual. However, such a procedure is desirable in that, if practiced on a sufficiently wide scale, the chances of transmission of malaria to others living in the same area are reduced.

Suppression, or prompt and adequate treatment of clinical attacks, are the most effective means of preventing the development or persistence of both vivax and falciparum gametocytes. However, falciparum gametocytes, once they have developed, are resistant to the action of most antimalarial agents. The 8-aminoquinolines, pamaquine and pentaquine, are unique in that even small doses rapidly result in the disappearance of falciparum gametocytes. Doses as low as 20 mg. daily for three days are sufficient for this purpose.

Chronic malaria—In highly malarious regions, patients are not infrequently seen who can be considered to have chronic malaria. These are persons who, in the absence of adequate treatment, harbor parasites in their blood for extended periods of time. Such persons generally have a considerable degree of resistance toward the development of obvious symptoms of malaria. However, from time to time this resistance may lessen and symptoms of malaria

develop. Such a syndrome is not seen when adequate suppressive therapy is .being administered except in the very occasional individual who may be infected by a strain specifically resistant to the suppressive drug being used. This is not to say that persons infected with vivax malaria and receiving suppressive treatment cannot have the tissue parasites and therefore be subject to relapses. It is important to realize, however, that with adequate suppressive therapy no patient need be liable to medical disability from such a circumstance.

Similarly, patients who have resided for considerable periods of time in an endemic malarious area are prone to have minor episodes of illness accompanied by parasitemia, which are in all probability mild but true relapses. With equal frequency, however, in both these classes of patients a diagnosis of malaria is made erroneously. This is because the presence of demonstrable parasites in the blood, though an essential for the diagnosis of a relapse in vivax malaria, does not necessarily mean that the malarial parasites are the etiologic agents in any given febrile episode. It is the lack of an appreciation of these facts that leads to the treatment of so many upper respiratory and other minor infections observed in these classes of patients with antimalarial drugs.*

*No attempt has been made to document these remarks with specific references. Most of the work reported was conducted as wartime research under the Office of Scientific Research and Development or has since been carried out as part of the program of investigators sponsored by the Malaria Study Section of the National Institute of Health. Publications by various investigators covering material presented above are now in the process of being presented in a systematic manner.

ABUSE OF PELVIC SURGERY

MILLER, of Ann Arbor, points out certain evidences of professional abuse in pelvic surgery in the female. Physicians should take cognizance of these findings. In spite of new forms of chemotherapy, improved obstetric care, and a vastly enlightened view of functional changes in female generative organs, the incidence of pelvic surgery has markedly increased during recent years. Coincident with this increase, surgical abuses have become more apparent.

In reviewing the literature, Miller cites a series of 1,137 gynecologic specimens from 11 hospitals, 314 of which were excised ovaries. Nearly 79 per cent of these ovaries were within normal physiologic limits. Study of another series of 934 "enlarged" ovaries revealed that 49.3 per cent were under the 5 cm. limit below which the ovary is considered of normal size. Further study revealed that removal of 96.9 per cent of these ovaries was not justified. Still another investigator pointed out that 75 per cent of a series of 1,320 ovaries removed at one hospital were normal.

The uterus likewise suffers abuse. Nearly one-half of 246 hysterectomies at 10 hospitals were performed in patients 40 to 49 years of age. Of the 246 patients, 17.4 per cent had no symptoms whatever, 18.6 per cent had normal pelvises at examination. Over 30 per cent of the excised organs revealed no microscopic evidence of disease. Finally, 16.6 per cent of the patients had neither symptoms, palpable pelvic disease, nor histopathology of the removed organs; and 33.1 per cent showed no disease or else disease contraindicating hysterectomy.

Although Miller is very generous with his colleagues, nonetheless he is forced to conclude that one-third of all extirpated uteri are absolutely free of disease.

DIAGNOSTIC CLINIC

FURTHER OBSERVATIONS ON ORBITAL

Prefrontal Lobotomy in Treatment of Chronic Mental Illness

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THE purpose of this paper is to present our experiences with prefrontal lobotomies at the St. Louis City Sanitarium, since 1942, and in particular to report to you some further observations with a modified technic. In 1945, we reported our results of operations on 100 patients who were suffering from chronic mental illness.

That the frontal lobes of the brain are in a measure concerned with the determination of personality is recognized and accepted. The first isolated attempt at surgical treatment of mental derangement was made in 1890 by Burckhardt who utilized multiple cortical excisions. Subsequently, on the basis of discoveries in the field of neurophysiology and psychopathology, Egas Moniz and Almeida Lima, in Portugal, made the first organized attempt to treat mental illness surgically with the subcortical injection of alcohol. Later, multiple cores into the subcortex at various points of the frontal area were employed. At about this time Ody attempted unilateral prefrontal lobectomy in a few cases. All of these procedures involve a considerable destruction of the cortex.

In an effort to reduce the amount of cortical injury, Freeman and Watts introduced and perfected the technic of leukotomy, consisting of undercutting the white fiber mass of all four quadrants of the frontal lobe, in a plane parallel to the coronal suture.

Having made certain anatomic and psychopathologic observations and being prompted by a desire to minimize still further the amount of brain damage, we at the St. Louis City Sanitarium, since 1942, have carried out a modified technic on 85 patients suffering with chronic mental illness.

From data accumulated through clinical pathologic observations, it was noted that patients suffering from tumors, particularly at the base of the frontal lobe, manifested a marked personality change. This was particularly borne out by the comprehensive study of Rylander,

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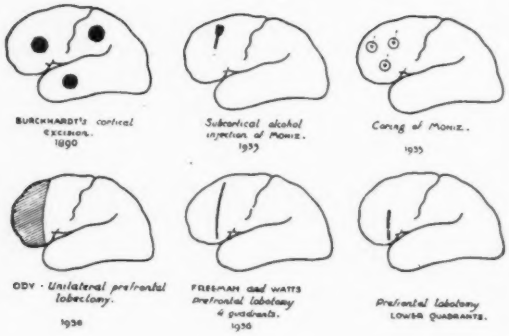
BURCKHARDT'S cortical EXCISION. 1890
Subcortical alcohol injection of MONIZ. 1935
Coring of MONIZ. 1935
ODY · Unilateral prefrontal lobectomy. 1936
FREEMAN and WATTS Prefrontal lobotomy 4 quadrants. 1936
Prefrontal lobotomy LOWER QUADRANTS.

Figure 1. Schematic outline of operative procedures.

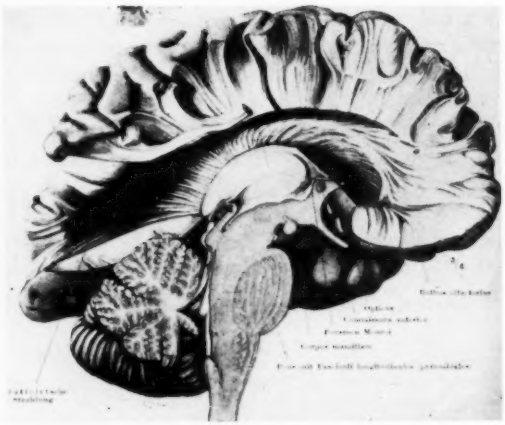

Figure 2. The anterior thalamic peduncle.
(From Braus-Enze: Textbook of Anatomy, Vol. IV.)

in about 24 cases. It was noted that patients who suffered head injuries with bruising of the base of the frontal lobe, and hemorrhaging into the base at the floor of the anterior fossa, were more likely to manifest definite personality changes. The case of Phineas Gage is an example. Furthermore, Freeman and Watts made observations that coring, particularly in the lower portions of the frontal lobe, produced a higher incidence of better results. (Figure 1.)

It will be noted that at the level of transection (Figure 2) the anterior thalamic peduncle is principally in the lower basal part of the frontal lobe. The effectiveness of the operation apparently is due to the degree of severing of these connections between the thalamus and frontal pole. These are afferent fibers from the thalamus to the frontal pole. The transection of these afferent fibers results in deafferentiation or desensitization of the related cortical areas in the frontal lobe. Psychiatrically speaking, the impact of inner experiences is greatly reduced.

As a great reception center, the thalamus receives messages from all the sensory modalities of the body. It, in turn, is hooked up with the hypothalamus, which is concerned with a great many vegetative and visceral functions. As can be seen from the sketch, the thalamus sends a great many fibers to the frontal area (Figure 3). Sectioning these fibers reduces the impact of ideas which formerly disturbed the emotions.

OPERATIVE TECHNIC

We have changed from avertin to sodium pentothal anesthesia. Through burr openings placed laterally in the skull, a blunt instrument is introduced into the subcortex after careful measurement, and section is down to the sphenoidal ridge. The extent and plane of the cut is usually checked by x-rays after the introduction of lipiodol. We have had no deaths from this procedure in this series at the City

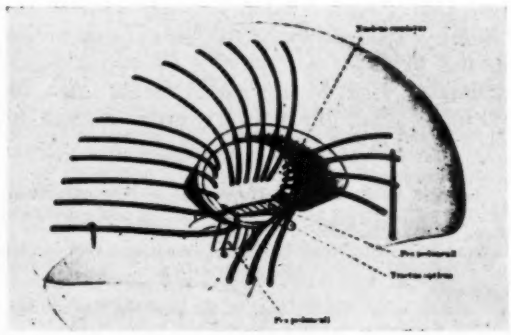

Figure 3. Schematic outline of association fibers.
(From Tandler, J.: Textbook of Anatomy, Vol. IV.)

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Sanitarium. There has been no wound infection. We have seen no epilepsy resulting from this technic. The incidence of temporary incontinence of urine is 18 per cent. There is the typical gain in weight in these patients. There is relaxation and the loss of tension. Tissue turgor is increased.

II. INDICATIONS AND RESULTS

The indications for psychosurgery comprise a number of diagnostic groups, both neuroses and psychoses. The common and outstanding factors indicating a decisive need for psychosurgery are the chronicity and malignancy of the mental processes; incapacitation of the patient by his often pronounced antisocial behavior; uncontrollable suicidal tendencies; and the failure to respond to any other treatment available, such as probination of hysteria, hypochondriasis, and anxiety, were included in the indication by Freeman and Watts, pioneers in the field of psychosurgery in this country. These types proved to respond favorably to lobotomy.

Schizophrenias, the most malignant of the mental diseases, are generally considered poor subjects for most therapies; with psychosurgery, however, more encouraging results were obtained in a series of 135 schizophrenic patients at the St. Louis City Sanitarium.

Into the category of "other types" fall psychoses in the epileptics, mental defectives, and postencephalitics, etc. Some slight ameliorating effect, limited to the psychotic behavior, has resulted.

Of 85 patients treated with the modified method of orbital lobotomy, 37 were men and 48 were women. Their ages ranged from 16 to 62 years, with an average of about 41 years. They had been mentally ill for from 1 to 36 years, the average being about 11 years.

Many of these patients showed not only social maladjustment, but antisocial behavior on a noisy, combative, destructive level. The majority (68 per cent) had received various forms of shock therapy, averaging 36 per patient, with no, or only transient, amelioration of symptoms. In general, they were all hopeless and inlonged psychotherapy, narco-analysis, intensive electric shock, or insulin shock treatment.

First considered for surgical treatment were affective reaction types, including involutional melancholias, often with suicidal tendencies, and manic-depressive psychoses, with their recurrent and disabling psychotic episodes. Such types were found to respond best.

Severe incapacitating psychoneuroses, particularly obsessive tension states, and the comcurable cases of mental illness, and the outlook as to remission or recovery was poor. Thus any postoperative change for the better which occurred could be regarded as the result of the operation.

The statistical results shown in Table 1 as to the ultimate outcome of improvement or recovery are practically identical with the original method of Freeman and Watts. Out of the en-

LEOPOLD HOFSTATTER

tire group of 85 patients 52, or 61 per cent, are improved, and 28 patients, or 33 per cent, are much improved. We considered as "much improved" those patients who were able to resume their former occupational and social responsibilities. Those who resumed occupational and social activities to a limited extent, within or outside of the hospital were considered "improved." "Slightly or not improved" patients were the ones who, after the operation, required less, or practically the same amount of, nursing care and therapeutic procedures, i.e., hydrotherapy, psychotherapy, and electric shock treatment.

TABLE 1

Disease	Number of Cases	Much Improved	Improved	Slight or no Improvement	Dead
Affective Reaction Types	8	7	1	0	0
Schizophrenias	63	16	19	28	0
Psychoneuroses	6	3	2	1	0
Other Types	8	2	2	4	0
Total	85	28	24	33	0

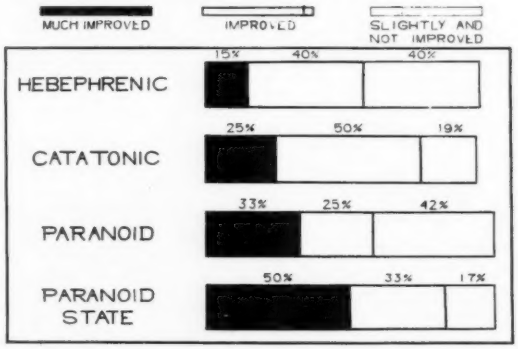
Within the schizophrenias, the improvement rate differs in the various subtypes.

The best results (Table 2) are obtained in the fearful, suspicious, or paranoid states (50 per cent), and in the more delusional, or paranoid schizophrenias (35 per cent), and the poorest in the negativistic or impulsive or catatonic (25 per cent), and in the silly, giggly, or hebephrenic group (15 per cent).

THE immediate postoperative picture is colored by the marked relaxation and the high degree of comfort and unconcern; the continuation of psychotic behavior that gradually decreases in intensity over a period of time was often observed. The transitory postoperative sequelae of urinary incontinence, intellectual slowing, and emotional dulling differ markedly in degree and duration with the technic employed.

TABLE 2

RESULTS OF BILATERAL PREFRONTAL LEUKOTOMY IN TYPES OF SCHIZOPHRENIA



Transitory intellectual slowing and emotional dulling were less pronounced and subsided earlier with the modified operation. This

clinical observation is well borne out in the results of systematic and extensive psychologic testing, particularly in the "rational learning tests" which were administered at regular intervals before and after operation. Patients who have recovered show a better mental grasp than before the operation; they were up to par in the application of pragmatic intelligence or common sense, and had ample drive to carry on. In general, most of them are indistinguishable from normal people.

The total convalescent time from the date of operation until the date of discharge from a mental hospital, during which reeducation and rehabilitation is of paramount importance, is considerably shortened with the modified method; this becomes apparent from a comparison of two groups of patients who were discharged after being operated upon with the original and modified methods, respectively: With the original method most of the patients (24 out of 30) were discharged within a period of over 500 days; the average time was six months postoperatively. With the modified method of orbital lobotomy most of the patients (27 out of 30) were discharged within 250 days; the average was three months after surgery.

The advantages of the modified method of the orbital leukotomy can be summarized as limitation of surgical procedure within the brain, diminution of postoperative sequelae, facilitation of retraining and rehabilitation, and shortening of recovery time and hospitalization.

Pre- and postoperative pictures of patient.

ANTHONY K. BUSCH

CASE HISTORIES

Case A—The patient is a 49-year-old man whose first attack of mental illness occurred in 1935. He became depressed, tried to harm himself, and had frequent arguments with his associates. He recovered and remained well for the next nine years with only transitory periods of being upset. In 1941 he became convinced he had cancer and began to worry. This progressed rapidly to feeling that his fellow employees were gangsters who were trying to frame him. He tried to commit suicide by slashing his throat and was hospitalized August 12, 1944. In the hospital he was depressed, indignant, and resentful. He felt he was going to be killed and was bothered constantly by voices calling him names. He failed to respond to electric shock and insulin therapy. Since he continued to make threats of suicide, a bilateral prefrontal lobotomy of only the upper quadrants was performed on February 2, 1946. After a short period of quiescence he again became suicidal,

Pre- and postoperative pictures of patient.

and a lower quadrant section was done by reoperation on April 18, 1946. He was discharged from the hospital ten weeks after the second operation. At present he is expecting reinstatement in his former job as switchman.

Case B—The patient, a 66-year-old woman, first began to consult physicians concerning her nervousness forty years ago. In 1924, she became so obsessive over cleanliness that her husband described her as liking her scrub-bucket and mop better than anything else in life. In 1937, after the death of her brother, she began to believe his death unnatural and felt people were trying to prevent her from investigating this. She became intolerably careless and created such scenes in public that she was hospitalized in a state institution in November, 1938. There she improved sufficiently to go home but had to be rehospitalized and was transferred to our hospital on April 16, 1942. On admission she was resentful and talked at length of the plots against her. On March 5, 1943, after failing to improve, a lower quadrant bilateral prefrontal lobotomy was performed. She was discharged as improved the end of the following month and has been out of the hospital for four and a half years.

Pre- and postoperative pictures of patient.

Case C—This patient is a woman 59 years old whose mental illness began with "nervousness" in January, 1938, following the suicide of her brother. The following year she left her husband and while living with a niece became pressed, refusing to eat, pacing the floor at night, moaning over and over, "What am I going to do?" Then she began to talk to imaginary people and became frightened that others were trying to do her harm. She was brought to the City Hospital in April, 1940, after attempting suicide. She was then 52 years old. From City Hospital she was transferred to State Hospital No. 2 (St. Joseph, Mo.). She was given 35 metrazol shock treatments. On May 12, 1941, she was transferred to our hospital.

On admission she was depressed and agitated; she chewed her fingers, pulled her hair, and scratched and picked at her skin. She was inaccessible, had to be tube-fed, and was resistive whenever she had to be cleaned. She was started on insulin and received 33 treatments, during which she gained some weight. During the later part of the insulin treatment she also received metrazol convulsive treatment. She would improve slightly. Then she would lapse back into being uncooperative, and additional metrazol would again bring her back to the point of cooperativeness. On February 6, 1942, four years after the onset of her illness, a prefrontal lobotomy was done on the right side, and on February 25 on the left side. She was discharged from the hospital May 22, 1942. She has lived at home for the past five years.

DIAGNOSTIC CLINIC

Diagnosis and Management of Buerger's Disease

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THROMBOANGIITIS obliterans is an inflammatory reaction of arteries and veins which attacks these vessels in segmental patches and results in vascular occlusions. Depending on the site of occlusion the disease may cause little disability, severe pain, or ischemic gangrene. While it occurs overwhelmingly in the extremities of the male, typical examples of it may be seen in women and it may localize to any part of the vascular system including cerebral, cardiac, renal, and mesenteric vessels. No age or race is exempt.

The lesion is a segmental, non-suppurative panarteritis which has a rather typical histologic picture. However, biopsy will only allow a positive diagnosis when the vessel is examined in the acute stage and at the exact level of segmental inflammation; otherwise a nonspecific fibrous arteritis or simple thrombosis will be diagnosed. For this reason, vessel-biopsies are seldom indicated. (Figure 1.)

Histologically, the early changes would suggest an endothelial reaction but a periarteritis or periphlebitis from ascending lymphatic invasion is also possible. Since the lesion is of a migrating and recurring character with spontaneous remissions, an infectious or allergic etiology has often been suggested but never convincingly proved.

As the offending agent, tobacco, bacterial and virus infection, ergot and dermatophytosis have been accused. It is quite possible that many agents may cause a similar inflammation of the vessel wall and that a specific cause need never be found; in fact, some authors regard the lesion not far afield from rheumatic infection and panarteritis nodosa.

From a practical standpoint, it is important to differentiate thromboangiitis obliterans from (1) peripheral vascular sclerosis, (2) frost-bite, (3) traumatic thrombosis, (4) simple arterial thrombosis, (5) thrombosis in a popliteal aneurysm, (6) arterial embolism, (7) polycythemia, (8) ergotism, and (9) diffuse arteriolar disease with hypertension. (Table 1.) The important point is to exclude all possible etiologic factors before the diagnosis of thromboangiitis is entertained.

The onset of this segmental vascular occlusion is so insidious that its early beginnings can only be elicited by close questioning. Rheumatic aches and pains, fleeting numbness,

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weak arches, charlie-horse, infected toenails are the presenting symptoms. Occasionally a sudden thrombosis in a superficial or deep vein or in a smaller artery is the first indication of the disease.

TABLE 1

DIFFERENTIAL DIAGNOSIS OF BUERGER'S DISEASE FROM:

Frost-bite	Arterial embolism
Traumatic thrombosis	Popliteal aneurysm with thrombosis
Simple thrombosis	Ergotism
Vascular sclerosis	Polycythemia
Diffuse arteriolar disease	

The recognition of this first stage by absent pulsations, by recurrent, migrating type of phlebitic streaks or nodules is very important because of the success of early treatment. If not checked, the lesion progresses slowly or will enter rapidly into a second stage of progressive extension, in which arteries and veins continue to close up and pain is so severe that it undermines the patient's morale unless it is effectively checked. (Figure 2.)

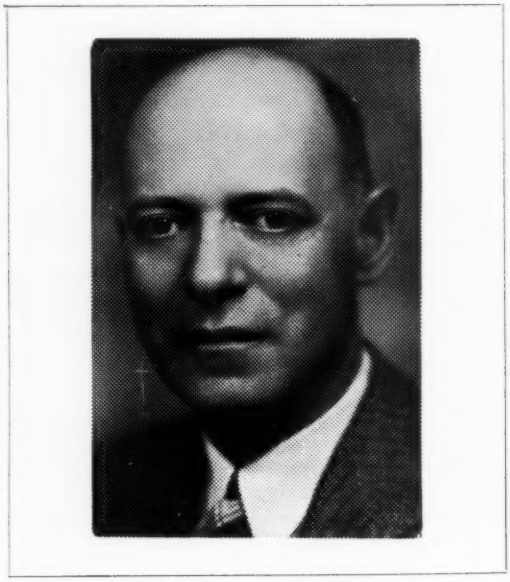
The disease then enters a quiescent or even healing stage where the disability is due to the occluded, crippled vascular tree with its consecutive ischemia. In the fourth stage, ulceration and gangrene develop, either because the disease had not gone into a remission or because the inciting or aggravating factors have continued to operate without adequate therapeutic check. (Table 2.)

TABLE 2

THE STAGES OF BUERGER'S DISEASE

1. Early, prodromal
2. Progressive, spreading
3. Quiescent, latent
4. Ischemic, ulcerating, gangrenous

In diagnosis of patients with occlusion of arteries or veins, the following findings are suggestive of the presence of thromboangiitis obliterans: (1) onset before 40 years of age, mostly in males, (2) history or evidence of superficial thrombophlebitis in patients without varicosities, (3) involvement of several extremities, especially closed radial pulses, which is rare in arteriosclerosis, and (4) lack of high blood-pressure, lack of x-ray evidence of calcification, lack of high blood sugar or high cholesterol. (Table 3.)



GEZA DE TAKATS

TABLE 3

SUGGESTIVE FINDINGS

1. Onset before age of 40.
2. Presence or history of superficial phlebitis.
3. Involvement of several extremities, especially a closed radial pulse.
4. Absence of hypertension, diabetes, hyperlipemia, or calcification in vessels by x-ray.

All patients suffering from Buerger's disease cannot be treated alike. Treatment must vary according to the stage of disease and the extent of irreversible damage in the tissues. (Table 4.)

In the early, prodromal stage, abstinence from tobacco, high salt and water intake, and

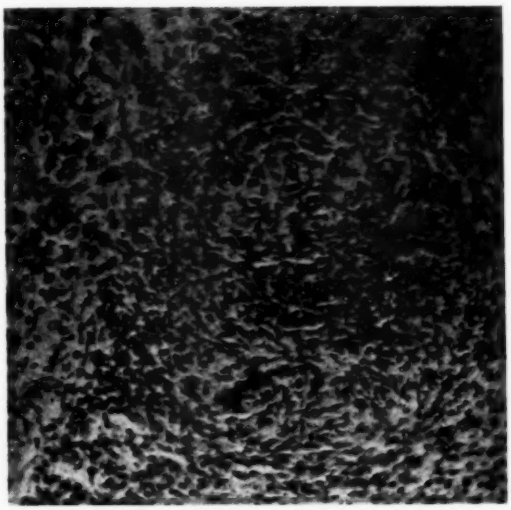


Figure 1. Biopsy of a small segment of phlebitis in an acute stage of Buerger's disease. Note the marked granulomatous reaction of the vessel wall which also includes a large, foreign body giant cell. This slide has been mistakenly diagnosed elsewhere as orginating from a tuberculous phlebitis.

eradication of any foci or infection (particularly of the teeth, tonsils, prostate, and ringworm infection of the feet) is prescribed.

In the active progressive stage, the tendency for increased bloodclotting is measured by the heparin-response and anticoagulants are added to the previous measures. X-ray treatment of recurring phlebitic patches and nodules has been helpful. Intravenous typhoid vaccine injections are also useful if not given in chill-producing doses. Generally speaking, however, to effect a rapid remission or stage of quiescence, the use of sodium tetrathionate has superseded, in our clinic, the treatment by typhoid vaccine. A series of twelve injections of sodium tetrathionate is given intravenously every second day.

In the third stage of multiple vascular occlusions with symptoms referable to ischemia but without activity of the disease, sympathectomy is the method of choice. The operation is never done without a preliminary procaine block to estimate the results to be expected. Sympathectomy does not influence the activity of Buerger's disease but simply stabilizes blood flow in the ischemic and vasospastic extremity. It may have to be combined with minor amputation at the time of operation. (Figure 3.)

Definite tissue loss occurs in the fourth stage, when minor amputations should not be delayed too long. Here again sympathectomy effectively lowers the level of amputation, which is optimally at mid-metatarsal level. Should a leg amputation be inevitable sympathectomy ensures a warm painless stump. Lumbar sympathectomy for the remaining extremity is almost a must for future protection.

Dorsal sympathectomy for ischemic or gangrenous fingers is very useful but here spontaneous healing should be allowed; after sympathectomy there is surprisingly little loss of tissue. For the angina in Buerger's disease, the same operation relieves the pain and improves the cardiogram.

The patient who has once had an acute stage of Buerger's disease must be made to know that reactivation of the process can be expected on resumption of smoking, following trauma, after exposure to cold, or some intercurrent infection. The last, of course, is almost impossible to prevent or foresee. Arteriosclerosis may be superimposed on his inflammatory reaction and aggravate the circulatory impairment.

TABLE 4

TREATMENT OF BUERGER'S DISEASE

STAGE	TREATMENT
1. Early	Abstinence from tobacco
	High salt-fluid intake
	Eradication of foci of infection
2. Progressive	Anticoagulants
	Sodium tetrathionate
	Typhoid vaccine
3. Quiescent	Sympathectomy
4. Destructive	Sympathectomy + amputation

In the remaining time, we have two patients here this morning whom the management was kind enough to procure, and I think both are most instructive.

The first patient is 65 years old. He has had

pain, redness, and swelling of the foot, and also intermittent claudication, that is, inability to walk more than a block or a block and a half since August, 1946. He was then unable to walk more than two blocks without severe pain, which was promptly relieved by rest.

In September, 1946, which is a little over a year ago, he first noticed coldness and redness of his right foot. The data that were very kindly supplied here by Dr. Morton are that his blood pressure is 180/110 (he is obviously a sclerotic type of individual with a high blood pressure, with, no doubt, a rigid sclerotic aorta); white count, red count, and hemoglobin normal. His hemoglobin is 15 gm. That is important because at this age, particularly with this flushed face, you want to rule out polycythemia. Polycythemia very often gives rise to peripheral thrombosis. It would be rather unusual for him to develop polycythemia at this late age.

Urinalysis is negative, which is important, although he still might have a high blood sugar because of a high kidney threshold, but I understand that is negative. His Wassermann and Kahn reactions are negative.

X-ray reveals calcification of the arteries of both legs.

He received a novocaine block to the first, second, third, and fourth lumbar segments, and there was no increase in skin temperature. He also received an intravenous injection of ½ gm. of tetraethyl ammonium chloride and there was no increase in the skin temperature of either leg or foot. There is a marked decrease in the size of oscillations with the oscillometer below the knee bilaterally.

TABLE 5
REACTIVATION OF BUERGER'S DISEASE OCCURS ON

1. Mechanical trauma
2. Exposure to cold
3. Resumption of smoking
4. Intercurrent infection

This gentleman, then, provides a very common and typical picture of a late stage of vascular sclerosis. I think those of us who are close enough can see this marked dependent rubor with edema, with capillary paralysis, and I understand that he also has osteoporosis.

Figure 2. Acute stage of thromboangiitis obliterans. Note the shining, swollen second and third toes on the left. There is also an area of raised hyperemic induration in the center of the dorsum of the left foot which represents a periphlebitic exudate.

Such a lesion will not respond to any type of vasodilator such as sympathetic block or tetraethyl ammonium chloride. Such lesions are excessively painful, particularly in the horizontal position. His threshold for pain must be rather low because he tells me that he does not have to sit up all night and hang his foot down, but very often the edema which you see in these people is simply a dependent edema and is due to the fact that they are unable to lie horizontally in bed. He denies this, but it is rather unusual for this lesion to be painless. If it is painless, it is because he also has a nerve involvement by this time in the form of an ischemic neuritis and the Achilles tendon reflexes in these people are very often absent, particularly in the diabetics, but frequently in the nondiabetics.

The question, of course, arises: What kind

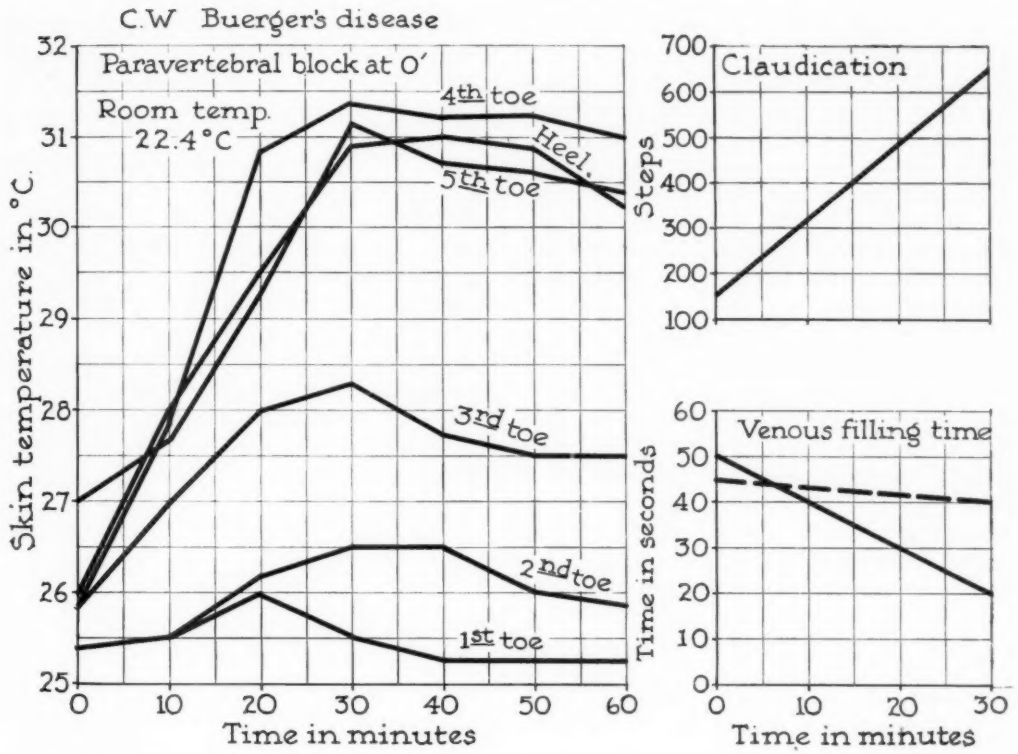


Figure 3. The results of paravertebral sympathetic block in a patient suffering from Buerger's disease. Graph on left shows the rise in skin temperature of the fourth and fifth toes to the normal vasodilation level (31°C.). The heel warms up equally well. The third toe warmed up from 26° to 27.5°C. The first and second toes did not warm up at all. Such a patient needs an amputation of his first and second toes; the third toe will remain cold after sympathectomy, but may improve with time. This same patient could walk 650 steps after sympathetic block without getting pain in the calf, against 150 steps before the block. This indicates that angiospasm is a factor in his claudication. The venous filling time (venous filling on the dorsum of the foot after 60 mm. of mercury pressure was inflated into a blood pressure cuff on the thigh) dropped from 50 to 20 seconds on the injected side; the change on the opposite side from 45 to 40 seconds is within the limits of error. Lumbar sympathectomy with amputation of the first two toes resulted in an excellent anatomic and functional recovery.

of management should the patient have? I should say that in examining the other foot, which always should be examined, you will notice that it is pulseless and of good color; the skin has good texture, and under normal environmental conditions here in St. Louis, which is about 85 or 86° Fahrenheit, even in this air-conditioned room he has a good warm foot. In other words, the lesion has come on slowly, there is enough collateral circulation, but we know from experience, we know from statistics, that if anything should happen to his right foot, there will be a great deal more burden placed on his left. Whatever treatment we suggest, it should be directed against the right foot and also in a preventive measure against the left foot.

The right foot will probably respond to, let

us say, a month of bed rest, in that pain will disappear, the rubor will perhaps improve as long as he is in bed, if he can afford to be in bed, and if there is sufficient hospital bed space for him; but the minute he begins to use the leg, it will revert to its previous conditon.

I do not believe that there is very much sense in waiting for this leg to become frankly gangrenous, because there is no question that he is unable to use this leg for any kind of locomotion.

What we tell the patient when we discuss the problem of removing a useless, nonviable extremity is that as long as there is any chance of saving an extremity it should be saved; if there is no chance to do that, if it only continues to be excessively painful, intractably painful, requiring more and more sedatives and immobilizing him in bed, then of course the problem of amputation should be considered, and with it, of course, the level should be studied.

In order to consider the level of amputation, it is necessary to observe the sudden drop in skin temperature at certain levels, and also perhaps place small flares of histamine into the skin; if they give a good flare—looking like a mosquito bite—you can be fairly certain that the stump will heal by primary intention.

This gentleman shows a fairly well preserved skin temperature down to the middle third of the right leg, which would indicate that he has fairly good collateral supply, and if his renal function is good and his coronary sclerosis is not too far advanced, he would probably tolerate a leg amputation.

This, of course, is a radical departure from the old dictum which said, "Never amputate an arteriosclerotic below the knee," but with certain simple measures, flapless guillotine amputations, and suturing nothing but the skin, it is possible to give these people a good flexible, movable knee-joint, which is extremely important.

If we were to handle the other extremity, we would tell this man that it is involved, that the pulses are closed, and we certainly would not want to have the other leg develop into the same condition as this one. Today we know of no better method for doing that than a prophylactic lumbar sympathectomy of the other, uninvolved leg. This should be done because should he lose the right leg, he is going to put far more weight on the left one, and we know that at least 50 to 60 per cent of patients run the danger of losing the second leg in this way.

We discuss this very freely with the patient. It is entirely up to him to make the decision. If he refuses this operation, we would put him on intermittent venous hyperemia treatments, which are of some benefit over a prolonged period of time but are not as effective as a lumbar sympathectomy.

I SHOULD like to show you a young gentleman presenting an entirely different picture. He is 39 years old, a male of French-Irish extraction. The idea that Buerger's disease affects only Jews is, of course, very erroneous and has been exploded many, many times. No racial or national group, no age is exempt, and there is no earthly reason why anybody might not get it. The only reason Buerger's disease was supposed to have been limited to Jewish people is that Dr. Buerger himself worked at Mount Sinai Hospital and of course the majority of his patients were Jews.

You will note, I think, that the patient has a dependent rubor. He has a small patch of hyperkeratosis, possibly gangrene, over the second toe. All his toes are cold, shiny, and rather stiff and fibrotic.

His history is that he noticed onset of slight pain in the calves on exertion at the age of 29. That is the early prodromal stage that I mentioned. That would have been the time for him to begin to drink a lot of water, take a lot of salt, and stop smoking entirely. At that stage it would have worked without any further curative measures.

He had no serious difficulty until November, 1946, at which time pain in the left foot be-

came severe and he had the sensation of walking barefoot on gravel. Then he had an onset of gangrene in March, 1947. He received some tetraethyl ammonium chloride and there was no increase in blood flow as measured by the photoelectric plethysmograph.

I should like to say that the most accurate, most delicate instrument measuring blood flow in digits has been developed in St. Louis by Dr. Hertzman. The patient has been studied in this group.

Histamine iontophoresis caused marked increase in blood flow. He has not stopped smoking. He gets some physical therapy. He states that he is better, but of course he is not rehabilitated in that he is unable to work. His other foot is pulseless. Both the posterior tibia and dorsalis pedis are closed. His radial pulses are open. No other known involvement is observed.

The treatment in this patient varies, of course, in different clinics. Our group insists on complete abstinence from tobacco. In fact, we tell patients not to come back to our clinic unless they can say they have stopped smoking, because we will be unable to do anything for them, and they are taking the place of others who have stopped smoking. We tell them to drink a great deal of water, to take a lot of salt. We would block his sympathetics, which was not done here because he refused to have it done. We would see how much rise in temperature he would get.

We would ask whether this patient wanted to be rehabilitated in two or three weeks or to go on for years, and it is quite possible that in six months or a year from now, particularly in a warm climate, this gangrene would be arrested, he would throw off a little tip of his toe, but if we wanted to rehabilitate him, since he is now in the quiescent stage we would advocate lumbar sympathectomy and removal of those toes which are obviously nonviable. If he then continues his abstinence from tobacco, the lesion burns itself out and he will be capable of going back to work.

NEW CANCER JOURNAL

A new journal, CANCER, sponsored by the American Cancer Society, will make its initial appearance this Spring. Every phase of the cancer problem will be covered, with major emphasis on clinical aspects. Dr. Fred W. Stewart, of Memorial Hospital, N. Y., will be the Editor-in-Chief, assisted by an Editorial Advisory Board of fifty authorities. In addition to original papers of highest calibre, the journal will publish a complete current bibliography of the world's cancer literature as well as comprehensive abstracts of the most significant articles. CANCER will be published bimonthly by Paul B. Hoeber, Inc., Medical Book Department of Harper & Brothers.

DIAGNOSTIC CLINIC

Carcinoma of the Esophagus

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THE increasing importance of carcinoma of the esophagus during the last few years can be explained by a number of reasons. Two seem particularly significant. The first is the recognition of the relative frequency and apparently increasing incidence of the disease. The second is the gratifying progress which has been made in its surgical treatment.

INCIDENCE

The increasing incidence of carcinoma of the esophagus is, like the increasing incidence of carcinoma of the lung, an interesting phenomenon which has aroused much speculative discussion but for which no entirely satisfactory explanation has been provided. Variations exist in the incidences reported from various parts of the world, but there is general agreement that the disease is increasing in frequency, as the official mortality figures clearly show in the United States: During the period from 1934 to 1944, the reported deaths from cancer of the esophagus increased from 2,243 to 2,949, an increase of approximately 30 per cent. Significantly, over the same period there was no increase in the number of deaths from cancer of the stomach and the duodenum. It is now generally agreed that the esophagus ranks high as a site of primary carcinoma, being ninth in frequency among the cases of malignant disease in the white male.[2]

No significant racial factor is apparent. Among 200 cases of the disease recently studied from Charity Hospital of Louisiana at New Orleans the white-Negro ratio of 45 to 55 per cent was approximately the same as the ratio for the white-Negro admissions. In this series the males outnumbered the females by approximately 2 to 1, and discrepancies of as high as 5 to 1 have been reported in the literature. The predominance of the male sex in the distribution of carcinoma of the esophagus has long been recognized, but no satisfactory explanation has been advanced for it.

The disease occurs principally in elderly individuals, the tendency for carcinoma of the esophagus to develop in the older age groups apparently being greater than is exhibited by other types of cancer. In the Charity Hospital series almost 70 per cent of the patients were in the sixth and seventh decades, though the age range was 31 to 84 years. Approximately 85 per

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cent of the patients were over 50 years of age, and 54 per cent were over 60 years of age. The age distribution has important therapeutic implications: Since elderly persons are, in general, poorer surgical risks than younger persons, the high incidence in this group has undoubtedly restricted the application of surgical treatment.

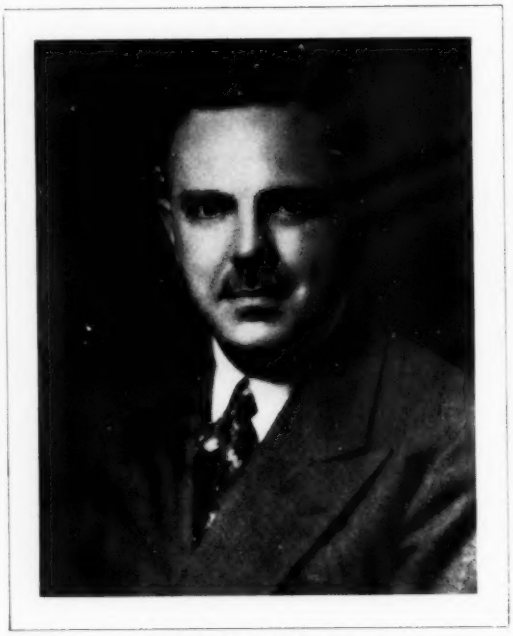
NATURE OF THE LESION

The malignant lesion may be located in any portion of the cervical or thoracic esophagus, though the greatest number of cases occur in the thoracic area. In the Charity Hospital series 20 per cent of the cases were located in the upper third, 37 per cent in the middle third, and 43 per cent in the lower third of the esophagus, the distribution paralleling the distribution in a collected series of 8,572 cases. The location of approximately 80 per cent of the cases in the thoracic and abdominal portions of the esophagus is a favorable therapeutic factor, since lesions in these areas can be treated by a more satisfactory surgical procedure than lesions occurring in the cervical portion.

HISTOLOGICALLY two types of carcinoma of the esophagus are known. The squamous cell variety, which is by far the more common, arises primarily from the epithelial lining of the esophagus proper and can occur in any portion of the canal. The lesion is usually ulcerative and presents tendencies toward proliferative growth near its borders and submucosal extension beyond its apparent peripheral limits. This tendency toward submucosal extension is surgically significant; the implication is that a generous resection is necessary in order to insure complete removal of the tumor-bearing portion of the esophagus. Adenocarcinoma, the second histologic type, is usually found in the lower segment of the esophagus. It probably arises, in most cases, in an upward extension of gastric mucosa in the region of the esophagus. Less frequently it may arise in islands of misplaced or aberrant gastric mucosa.

The rapidly progressive deterioration manifested clinically by patients with carcinoma of the esophagus suggests that the disease is associated with a high degree of malignancy. To some extent this impression is due to the obstructive character of the lesion, which results in prompt and progressive starvation. To a greater extent, however, the lethal character of carcinoma of the esophagus is due to its invasive tendencies and its close proximity to vital structures. In most instances in which the lower and middle portions of the esophagus are involved, lymph node metastasis is directed caudally. Extension is to nodes in the hilar region, to a small group of somewhat lower periesophageal nodes, to a ring of nodes about the cardia, and to nodes in the gastrohepatic ligament, particularly in the region of the left gastric artery. Invasion of regional lymph nodes occurs more frequently than was once believed,

but a significant number of patients still come to autopsy without extensive lymph node involvement.



ALTON OCHSNER

CLINICAL MANIFESTATIONS

The characteristic clinical manifestations of carcinoma of the esophagus, which include dysphagia, marked loss of weight and strength, dehydration, anorexia, regurgitation, salivation, and hematemesis, unfortunately become evident only when the disease has progressed beyond the point of curative therapy. The earliest manifestations are often so vague that they are likely to be disregarded by both physician and patient and a great deal of invaluable time is lost between the onset of symptoms and the establishment of the diagnosis. This is demonstrated by the fact that the average duration of symptoms in our experience as well as that of others is from four to six months, and it is even longer in a high proportion of cases.

Although dysphagia is a common and characteristic symptom of carcinoma of the esophagus, and is usually described as the earliest symptom, in a large number of cases it is preceded by such vague disturbances as a sense of oppression or fullness in the chest or substernal region, epigastric discomfort, heartburn, and increased salivation. These disturbances, particularly epigastric distress, are usually associated with the swallowing of food and tend to disappear after the meal.

In the beginning symptoms are insidious and intermittent, but over a period of several months they become progressively more prominent and definitive. The substernal discomfort or epigastric distress becomes clearly associated with the swallowing of food and is recognized as definite dysphagia. Whereas previously the patient has been only vaguely aware of some discomfort in swallowing, he now becomes acutely aware of it.

Dysphagia is first noticed as a peculiar sensation of tightness, as if food were sticking in the throat, especially when a large bolus of solid food is swallowed. Regurgitation becomes more frequent, and when the patient finds that he thus secures relief, he begins to induce it voluntarily. At first regurgitation occurs only at long intervals. Then the intervals become shorter, and finally it occurs at each meal, even when only soft foods are taken. The patient does not immediately suffer the consequences, for he learns by experience to masticate his food well, to eat slowly, and to try to wash it down by drinking large amounts of fluid with each meal. As the disease advances, however, and as dysphagia becomes more severe, the consequences of starvation become apparent. Anorexia develops and evidences of deterioration appear, such as progressive loss of weight and strength, inanition, dehydration, anemia, and cachexia.

Figure 1. Preoperative roentgenogram (Case 1) following ingestion of barium showing constricting lesion of lower third of esophagus producing almost complete obstruction. This patient, a white male, 67 years of age, presented manifestations of progressively increasing dysphagia and debility over a period of approximately one year. The lesion on biopsy was found to be adenocarcinoma.

Figure 2. Postoperative roentgenogram (Case 1) following ingestion of barium showing esophagus, stomach, and well-functioning stoma. During the six-month period which has elapsed since operation the patient has been able to eat and to swallow normally.

DIAGNOSIS

The insidious onset of the disease and the vague character of the first manifestations account for much of the difficulty in making the diagnosis early. It is therefore of the utmost importance that the earliest symptoms be recognized. Only by constantly bearing in mind that carcinoma of the esophagus may explain such vague manifestations as have been listed can the diagnosis be made early and at a time when curative therapy is still possible. The key to improvement in early diagnosis lies in the constant recollection of the possibility, and suspicion should be particularly strong in elderly male patients.

Once the condition is suspected, there is usually little difficulty in excluding or establishing the diagnosis by utilizing two special procedures, esophagography and esophagoscopy. It is usually possible by the use of esophagography, that is, the fluoroscopic and roentgenologic examination of the esophagus by means of a barium meal, to determine whether the disease is present or absent. Esophagoscopy permits complete visualization of the entire esophagus, with biopsy of all suspicious areas and all definite lesions. Neither procedure should ever be omitted in a patient suspected of having carcinoma of the esophagus.

THERAPY

The only curative treatment of carcinoma of the esophagus is surgical extirpation. Any other therapeutic measure is palliative, and no other measure, experience has shown, sig-

Figure 3. Photograph of patient with carcinoma of esophagus (Case 1) taken a week after operation. Note extreme emaciation, which is characteristic of this disease. In spite of the usually poor condition of such patients, they are able, with preoperative and postoperative care, to tolerate the extensive surgery required.

nificantly increases the survival period. The prognosis in carcinoma of the esophagus is hopeless unless the lesion can be resected, the average survival period in untreated cases being not more than six to eight months.

The surgical treatment of carcinoma of the esophagus consists essentially in the removal of the tumor-bearing area of the canal, together with excision of the regional lymph nodes, followed by restoration of the continuity of the alimentary tract by intrathoracic esophagogastrostomy. Until recently this method of surgical treatment was applicable only to lesions of the lower third of the esophagus. Now the demonstration by Garlock[3] and Sweet[5] that the stomach can be more completely mobilized has extended its usefulness to lesions higher in the esophagus. It has thus become possible to employ a safe and satisfactory surgical procedure, with immediate restoration of function, to lesions on virtually all levels of the intrathoracic esophagus.

Technical details of the preferred operative procedure have been presented elsewhere and need not be considered here.[1, 4] The operation has now become fairly well standardized. Its essential steps are (1) a left thoracic or combined thoracoabdominal approach, the latter being particularly useful in certain types of low-lying lesions; (2) mobilization of the esophagus well above the lesion; (3) mobilization of the stomach through an opening in the diaphragm, care being taken to preserve the blood supply through the right gastric and right gastroepiploic arteries; (4) resection of the tumor-bearing area and regional lymph nodes, and (5) anastomosis of the proximal end of the esophagus to the anterior wall of the stomach.

MORTALITY

Although gratifying progress has been made in recent years in the surgical treatment of carcinoma of the esophagus, the frequency with which resection can be applied is still discouragingly low. Our own experience, like the experience of others, bears witness to that fact. In a collected series of 794 cases, exploration was possible in only 209 (26.3 per cent), only 115 of which (14.5 per cent of the total series)

Figure 4. Preoperative roentgenogram (Case 2) following ingestion of barium showing constricting lesion in midesophagus. This patient, a white female, 47 years of age, presented manifestations of progressively increasing dysphagia and debility for approximately nine months. The lesion on biopsy proved to be a squamous cell carcinoma.

Figure 5. Postoperative roentgenogram (Case 2) following ingestion of barium approximately three months after resection of the esophagus and regional lymph nodes, followed by esophagogastrostomy at the level of the upper part of the aortic arch. Fluoroscopic studies revealed a normally functioning stoma. The patient could now eat and swallow normally.

were found resectable. In the 200 cases studied from the New Orleans Charity Hospital and the Ochsner Clinic, exploration was possible in only 58 (29 per cent) and resection was possible in only 32 (16 per cent). Only earlier diagnosis can improve these proportions.

As experience with the radical operation for carcinoma of the esophagus has increased, the immediate postoperative mortality has steadily decreased. In our first 16 personal cases the mortality was 75 per cent. In the last 16 cases it was 31 per cent. In the first 8 cases in the last group it was 37.5 per cent. In the last 8 cases in this group it was 25 per cent. Similar experiences have been reported by others, and it is reasonable to believe that the mortality will be reduced even further as experience with the surgical management of these cases accumulates and as the incidence of earlier cases increases.

The curve for survival rate following resection for carcinoma of the esophagus is similar in character to the curves for other forms of cancer amenable to surgical treatment. It drops steeply during the first two years after operation, at the end of which time only 22 per cent of the patients are still alive. It falls much more slowly during the next three years, and at the end of the fifth year after resection, 11 per cent of all patients are likely to be still alive.

SUMMARY

1. In recent years carcinoma of the esophagus has assumed growing importance. This is due in great measure to the recognition of its relative frequency and apparently increasing incidence and to the gratifying progress that has been made in its surgical treatment.

2. The disease occurs predominantly in elderly individuals and more frequently in the male sex. There is no significant racial factor.

3. The lesion may occur in any portion of the esophagus with about one-fifth of the cases being found in the upper third and the remainder in almost equal proportions in the other two-thirds. Histologically two types of carcinoma are recognized, the squamous cell variety which is the more common, and adenocarcinoma which is most frequently observed in the lower regions of the esophagus.

4. In the earlier stages of the disease the clinical manifestations are insidious in onset and vague and intermittent in character with such disturbances as a sense of oppression or fullness in the chest or substernal region, epigastric discomfort, heartburn, and increased salivation. Gradually these disturbances become more clearly associated with the swallowing of food. As dysphagia becomes progressively worse the effects of starvation become apparent with the development of loss of weight, inanition, and dehydration. The need for greater awareness of the early manifestations of the disease is shown by the fact that the average duration of symptoms before establishment of the diagnosis is from four to six months or longer.

5. The diagnosis may be readily established by two procedures, esophagography and esophagoscopy. These procedures should always be done in any patient suspected of having carcinoma of the esophagus. The key to improvement in early diagnosis, however, lies in the constant recollection of the possibility of the presence of the disease, and suspicion should be particularly strong in elderly male patients with such vague disturbances as described.

6. The only curative treatment of carcinoma of the esophagus is surgical extirpation. The surgical treatment of carcinoma of the esophagus consists essentially in the removal of the tumor-bearing area together with the regional lymph nodes, followed by restoration of the continuity of the alimentary tract by intrathoracic esophagogastrostomy.

7. Analysis of past experience with carcinoma of the esophagus shows that about one-fourth to one-third of the cases encountered appeared operable and were subjected to exploration. Of this number between one-half and two-thirds were found resectable. Only earlier diagnosis can improve these proportions.

8. As experience with the surgical treatment of carcinoma of the esophagus has increased, the mortality has steadily decreased. The survival rate following resection for carcinoma of the esophagus is similar in character to that for other forms of cancer, with the greatest drop in survival occurring during the first two years after operation.

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SCIENTIFIC EXHIBIT

Modern Treatment of Diabetic Gangrene

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Since the modern viewpoint toward thromboangiitis obliterans relative to conservative treatment has been accepted quite generally, it seems pertinent to apply the same ideas in the management of diabetic gangrene. The antiquated classification of "dry" and "wet" gangrene, and the hysterical fear that diabetic gangrene means immediate amputation of the limb, are responsible for the lamentable errors in treatment too often seen.

Realizing this state of affairs some ten or fifteen years ago, I resolved to analyze the cases of diabetic gangrene on the fourth Surgical Division at Bellevue Hospital with a view to a more logical and more satisfactory approach. My interest was stimulated particularly by a case of diabetic gangrene with severe secondary infection of the foot in a 29-year-old woman whose leg was amputated as an emergency measure. It seemed to me, at that time, that such radical therapy was merely a result of insufficient knowledge of the pathology and course of these cases. I also realized that the prevailing knowledge of this subject was incomplete and inaccurate, based upon tradition and ignorance.

The first step in proper treatment is correct knowledge of the underlying pathologic process. Thus, there are two main types of gangrene of the extremities. The first is the simple occlusive type encountered in embolism and thrombosis, previously designated "dry" gangrene. This type is not often seen in diabetic patients, but is more common in simple arteriosclerosis obliterans. This I have designated "primary" or purely "vascular" gangrene. The second type of gangrene I have designated "secondary" or "infected" gangrene, disregarding the medieval term of "wet" or "moist" gangrene. This is the type most often observed in the diabetic arteriosclerotic patient. At this point it is necessary to emphasize a hitherto neglected factor in the development of this type of gangrene, namely, mycotic infection.

Mycotic or fungus infection of the feet is more common than is realized, and while in the healthy young adult "athlete's foot" may be more annoying than dangerous, in the arteriosclerotic or diabetic patient it may prove to be of the greatest consequence. These organisms may be present in great variety and are particularly fond of collections of dead epithelium on human feet and legs. They may be present throughout the life of the individual without producing any symptoms or signs. Favorite locations for these mycotic foci are corns, calluses, lateral nail margins, fissures of the heel, plantar surfaces of the toes and interdigital spaces. In any of these places these fungi may be present in an inactive stage for many years without the production of symptoms or signs of any kind. At the slightest provocation, however, they may initiate a series of events which may terminate in gangrene, loss of limb, or death of a patient. The most common occurrence is the spontaneous formation of a bleb or blister. Other inciting events are paring of corns or calluses with unsterile instruments, picking at corns, calluses or

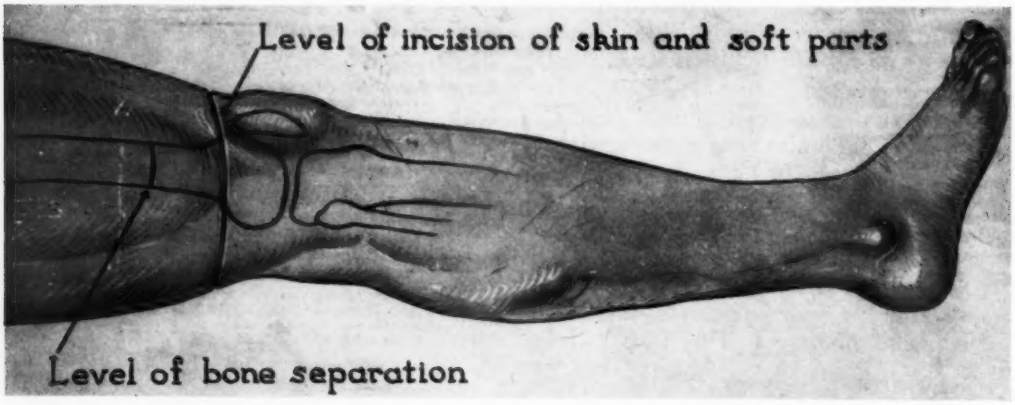
CLASSIFICATION OF DIABETIC GANGRENE

A. Primary (vascular obstructive)
B. Secondary (to infection usually mycotic)

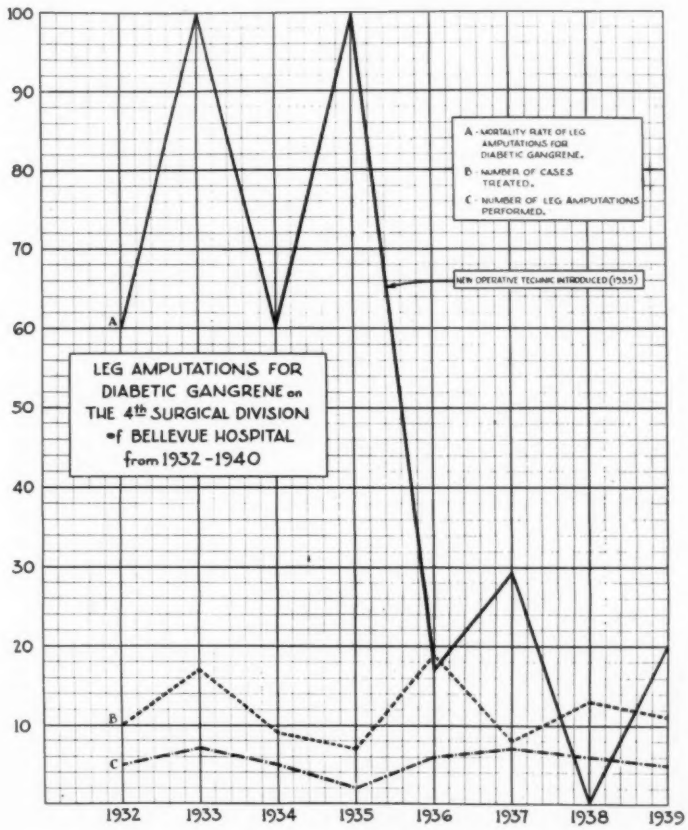
so-called ingrown toe nails with dirty finger nails, and finally spontaneous interdigital exacerbations, particularly where poor foot hygiene has been observed. Chafing from tight shoes has been exaggerated as a cause of these infections.

Following the initial incident of pure mycotic infections, a pathway is usually opened for the invasion of pyogenic organisms, which within twenty-four hours may show the classical signs of infection of the immediate neighborhood, namely, redness, edema, pain, lymphangitis, fever and, above all, a change in the diabetic status resulting in decreased tolerance to insulin, increased sugar in the urine and elevated blood sugar. If recognized at this stage, these infections can usually be easily checked by the application of suitable measures, such as complete bed rest, local application of mild antiseptic, preferably azochloramid, or the dusting of a fungicide, one or more of the higher fatty acids or their salts. The latter are best used in a non-irritating powder base, preferably boric acid. Penicillin may be given systemically as an additional measure.

It is unfortunate that many cases are completely unrecognized at this stage and are allowed to progress to purulent infection of tendon sheaths, fascial spaces and other structures of the foot. As a result of the pressure of the infected area upon the arterial circulation and thrombosis of the smaller arteries in the immediate area, gangrene of adjacent digits rapidly makes its appearance. If still untreated, the diabetic situation becomes more serious, sometimes throwing the patient into coma in spite of heroic doses of insulin. At this time the gangrene may spread alarmingly to involve major portions of the foot. It is in this type of case that the most tragic errors in surgical judgment are occurring daily. The inexperienced internist or surgeon presented with this picture of infection, gangrene, high temperature, and uncontrolled diabetes, becomes frightened and



advises immediate amputation of the leg as a life saving procedure. As as a matter of fact, logical analysis of the situation should convince any physician that the proper approach to the situation is to correct the underlying infection, rather than to eliminate the whole extremity by an amputation. In other words, since the gangrene and the diabetic confusion are the direct result of the infection, proper steps for its control are in order. Hence, the properly



planned incision in the foot, with particular regard to the location of tendon sheaths and fascial spaces, as in surgery of the hand, is the indicated procedure. No anesthetics are necessary, as the diabetic foot is extremely insensitive and allows extensive incisions without any anesthesia. Furthermore, injection of local anesthetic into the foot, or use of a freezing anesthesia, will cause immediate gangrene.

It is astonishing to see how many physicians, entirely unaware of the elements of infection in diabetic gangrene, turn all of their attention to improving the circulation at this stage, with the mistaken idea that all of the events described can be attributed to deficient circulation. Many of them perform paravertebral block, sympathectomy, or other similar ineffective measures to "improve" circulation, neglecting completely the all important feature of infection.

As soon as the diagnosis of a purulent infection of the foot has been made, its path should be traced by means of a grooved director or similar instrument, starting at the point of

METHOD OF CONSERVATIVE TREATMENT

A. *Primary gangrene*
1. **Wait for line of demarcation**
2. **Remove gangrenous portions**

B. *Secondary gangrene*
1. **Control infection with**
   a. **Adequate incision**
   b. **Packing with azochloramide**
   c. **Fungicidal powder**
   d. **Penicillin systemically**
2. **Remove gangrenous tissue**

C. *Treatment for circulation*
   a. **No smoking**
   b. **Whiskey**
   c. **Wrap leg in cotton**

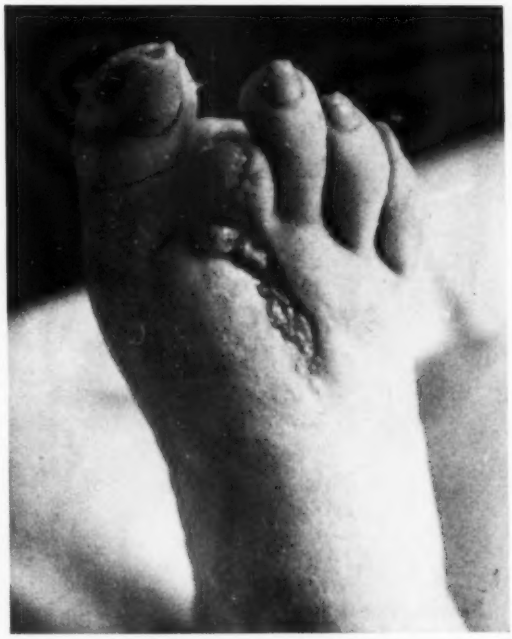
origin, whether it be a callus, corn, or similar focus. The grooved director should be passed to the lowest depths of the infection track and while held in this position a sharp straight scissors should, with one quick cut, open all of the overlying tissue. The edges of the wound are widely spread apart and all necrotic tendons and similar gangrenous tissue must be debrided. The cavity is then washed out with peroxide of hydrogen, followed by a weak chloramine solution or similar mild antiseptic. A fungicidal dusting powder, with a boric acid base, is then dusted into all parts of the cavity and a firm packing of gauze, saturated with azochloramid in triacetin, is then literally stuffed into the infected area. A protective dressing is then applied. Penicillin, in doses of 50,000 units intramuscularly, should be given every three hours. The sulfa drugs have proven inefficient in these cases. Dressings are changed daily and all necrotic and gangrenous tissue carefully removed. Palpation in the immediate infected area may reveal new unopened pus pockets. If present, the incision should be appropriately extended and the same procedure of irrigation and packing continued.

The oscillometer is invaluable as a prognosticator of the outcome of this form of therapy. In every case a reading should be taken at the ankle level. If the reading is positive to any degree, the prognosis is good in proportion to the amplitude of pulsation. Similarly, if the reading of the ankle of the affected foot is zero, a successful outcome is in doubt, but conservative treatment should be given a trial. The pitiful attempt of the inexperienced physician to obtain information by palpating dorsalis pedis and posterior tibial pulses in these cases is tragic in its inaccuracy and incompleteness. To treat a case of diabetic gangrene without an oscillometer is as ineffectual as treatment of hypertension without a sphygmomanometer.

Having properly released the infection of the foot, an immediate effect will be observed upon the temperature and upon the diabetic situation. This effect is so rapid that it is inadvisable to give protamine insulin in these cases because upon release of the infection there may be a rapid decline in blood sugar sufficient to produce insulin shock. For this reason regular insulin in periodic smaller doses, subject to control, is preferable. Repeated daily dressings, following the above routine are carried out with attention to every detail. Within a few weeks healthy granulations will appear in various parts of the infected area and complete healing should occur within a period of three to twelve months, depending upon the extent of the incision, the oscillometric reading, and the patient's general condition. The dressing routine is continued without change until the very end. Penicillin may be discontinued when the physician feels that all danger of spreading infection has disappeared.

While the cooperation of an internist in the diabetic situation is feasible and desirable in a public hospital service, it is questionable whether this is necessary in private practice, as the expense of one physician is usually great enough to preclude the service of a diabetic

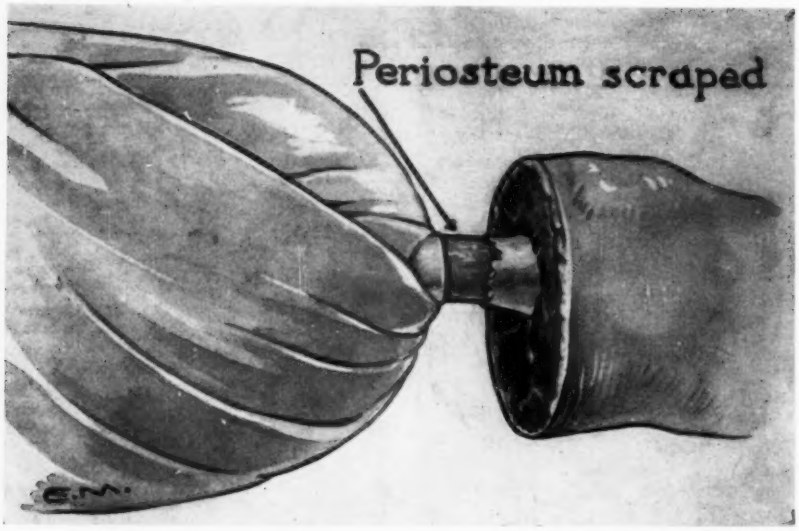
Gangrene from ingrown toenail.



Healed gangrene with infection.

Plantar infection with gangrene.

Same case healed.



specialist. For this reason, no one should attempt the treatment of a case of diabetic gangrene until equipped with sufficient surgical and medical training to handle personally both phases of the case. This emphasizes the importance of a thorough grounding in both medical and surgical procedures for anyone contemplating the specialty of peripheral vascular diseases.

INDICATIONS FOR MAJOR AMPUTATION

Methods of amputation

1. **Supracondylar**
   a. **Simplest with lowest mortality**
2. **Below knee**
   a. **Only with good oscillometric readings**

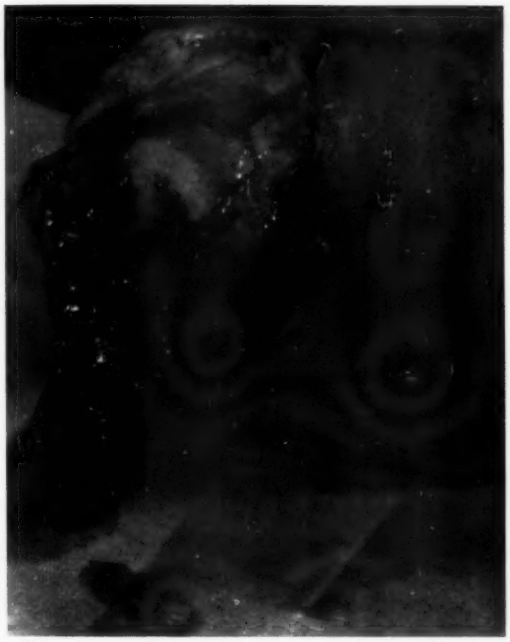
Anesthesia

a. **Cyclopropane**
b. **Intravenous pentothal**
c. **Refrigeration not recommended**

As soon as the infection in the foot has been checked a complete change in the clinical situation takes place. The temperature remains normal continuously, the diabetes becomes comparatively mild, depending upon the original severity before infection, and control of the diabetes is now fairly easy. In most cases protamine zinc insulin may now be used once daily instead of the multiple injections of regular insulin. A good indication that this stage has been reached is the appearance of the infected area and of the entire limb. All edema disappears and areas of gangrene and slough are easily separated from underlying healthy granulations, sometimes by simple traction with an artery clamp or by gentle dissection with a sharp scissors. From this time on the patient may be kept out of bed in a chair throughout the day. The general condition improves steadily, illustrated by a better appetite and absence of pain and discomfort. The daily dressings are continued, using the same procedure, namely, irrigation with hydrogen peroxide, followed by chloramine solution, dusting with a fungicidal powder and packing with azochloramid gauze.

When the entire area appears clean and is covered with healthy granulations, the dressings are changed to boric acid ointment spread on gauze. This is applied directly to the granulating areas preceded by a light dusting with the fungicidal powder. A foot soak of green soap and water prior to each dressing, for a period of about 15 to 20 minutes, keeps the wound clean and apparently stimulates granulation and epithelialization. It is astonishing to note the extent of areas of granulation that will epithelialize spontaneously without resort to skin grafting.

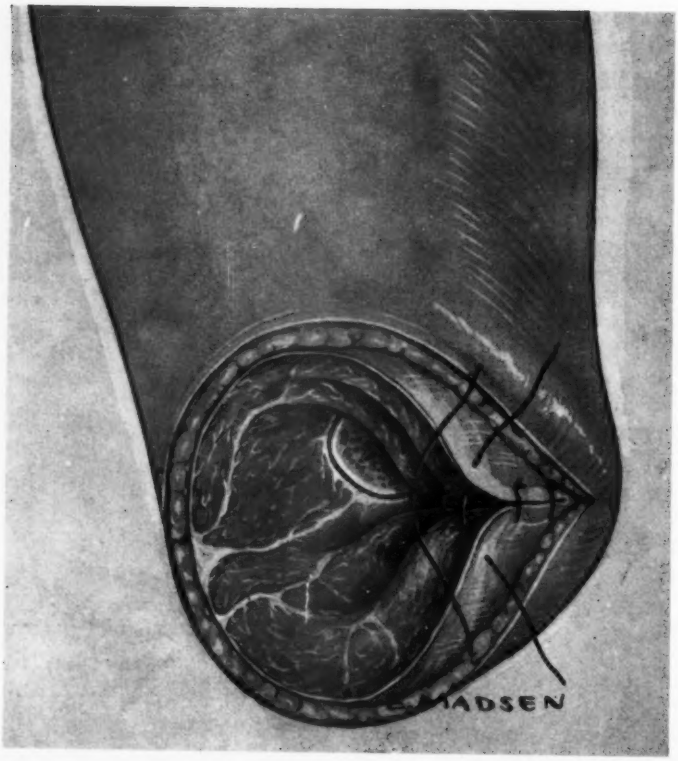
Massive gangrene.



Same case with spontaneous amputation of toes.

Loss of toes or part of the foot does not interfere sufficiently with standing or locomotion to be of any consequence in the treatment. In many cases all that remains is the heel, and this has proven sufficient for standing and locomotion even in the case of patients who have had the other leg amputated and are getting about on an artificial limb.

Same case. Healed. Age 74.



Secondary gangrene.

It must not be assumed that every case of diabetic gangrene will respond to conservative treatment. There are some, unfortunately, in which a major amputation must be performed. As a rule these are cases with zero oscillometric readings at the ankle level, indicating badly damaged arterial circulation with little or no recuperative power. In these cases control of the infection is difficult due to the poor blood supply, and as a result the gangrene may destroy the entire weight-bearing area. The final decision, however, must rest upon the personal experience and judgment of the peripheral vascular surgeon, for it is only by this means that one can arrive at a logical decision in a difficult case. Roughly, however, uncontrollable infection and destruction of weight-bearing areas are indications for a major amputation.

The level of amputation is important. The simplest, safest procedure with the lowest mortality rate on record is the supracondylar amputation, just above the knee joint. There is no excuse for a mid-thigh amputation as nothing is gained thereby and on the contrary the shock of this procedure may overwhelm the patient. Amputation below the knee is successful only if the oscillometer indicates a fairly good reading at the ankle level. If this is so, there is usually sufficient collateral circulation in the limb to conquer the infection and limit the gangrene. Therefore, no amputation at all is probably in order. Many surgeons who report brilliant results from amputations below the knee are probably operating upon patients that require no major surgery whatever and would undoubtedly have healed with proper conservative therapy. I am sure that many of the cases in this exhibit illustrate this point very well. It is unfortunate that too many surgeons are quick to perform an amputation below the knee when proper conservative therapy would have resulted in the loss of a few toes.

Bilateral gangrene. Healed.

Primary gangrene.

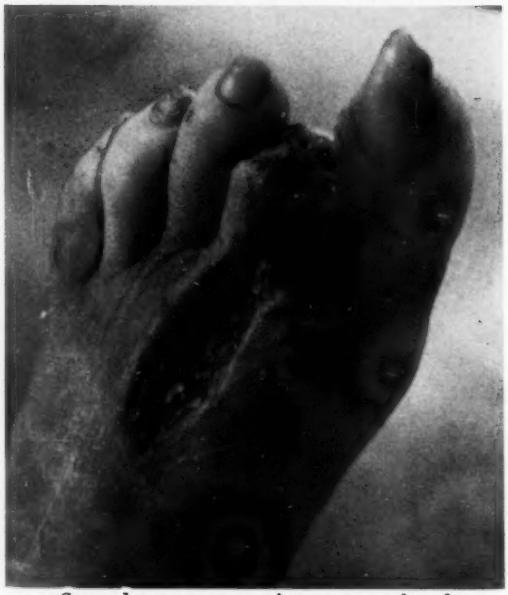
The operation is performed under a general anesthetic, preferably cyclopropane, or, where this cannot be used, intravenous pentothal fortified with nitrous oxide-oxygen. Refrigeration

Completely healed. Note stump of toe.

Plantar infection laid wide open.

anesthesia is a reversal to medieval surgery and in my opinion has no place whatsoever in amputation for diabetic gangrene. Contamination of the operative field with dirty ice has resulted in numerous cases of gas bacillus infection of the stump reported from various parts of the world. Any good results that have been reported with refrigeration are due to the simplified operative technic rather than to the freezing. Psychic shock during the operation is another serious objection to refrigeration anesthesia.

A tourniquet is unnecessary and should not be used. A simple circular incision is carried in one plane down to the bone. Playing with the sciatic nerve is strictly avoided. It is merely cut and allowed to retract. Accurate hemostasis is essential. When the bone is reached the soft parts are retracted proximally for about two inches and at this point the periosteum of the femur is cut and scraped distally. The bone is



Secondary gangrene of toe removed and dorsal infection laid wide open.

now sawed through, avoiding all manipulation of the end of the bone and bone marrow. The soft parts are now allowed to fall together naturally and the muscles and fascia are approximated by a few sutures. Silk or cotton should be used throughout as catgut causes collections of serum. The skin edges are approximated carefully and no drains are inserted. The patient is allowed to sit up in bed as soon as possible after anesthesia and is put out in a wheel chair the following morning. The preoperative dietary routine is resumed at once and no shock of any kind should be apparent. The dressing is changed on the third day at which time the patient may be up and about on crutches. The sutures are removed on the sixth or seventh day and the patient discharged from the hospital the following day. An artificial limb may be fitted within a few weeks, contrary to the traditional practice of waiting six months to a year. My personal mortality rate for this type of operation is 5 per cent.

Plantar calluses infected with tinea, a frequent point of origin of secondary diabetic gangrene.

Diabetic gangrene with infection following use of hot water bottle.

Two-stage operations below the knee and other complicated procedures entail prolonged hospitalization, physical and mental shock, and serve no useful purpose. A supracondylar amputation, here described, has the lowest mortality, the shortest hospital stay, the least shock, both physical and mental, the quickest recovery, and the least expense.

In conclusion, I have tried to emphasize the importance of recognizing the overwhelming influence of infection in the pathogenesis of diabetic gangrene, minimizing the importance of the circulatory status of the extremity which is only too often exaggerated in therapy. By recognizing the effect of mycotic and pyogenic infection upon the development of gangrene and outlining treatment accordingly, many amputations of legs will be avoided and many lives spared thereby.

Book of the Month—A Report

SEXUAL BEHAVIOR IN THE HUMAN MALE*

HERE is a book that should be in the reference library of every physician. By now more people have read reviews of Kinsey's work than of any scientific book to appear in recent time; and it is genuinely deserving of this recognition. Nevertheless, and important to bear in mind, the book is basically no more than a first report on an extensive taxonomic (classificatory) research program. As is appropriate for such a report, the most significant data are presented in extensive tabular and diagrammatic form. How many readers will do much more than read the general summaries or look at the figures? At these levels of study some unwarranted conclusions are likely to result.

Relative to the objectives of the study the authors say, "The present study, then, represents an attempt to accumulate an objectively determined body of fact about sex which strictly avoids social or moral interpretations of the fact. Each person who reads this report will want to make interpretations in accordance with his understanding of moral values and social significance; but that is not part of the scientific method, and, indeed, scientists have no special capacities for making such evaluations." (p. 5) This admirable statement of the objectives could profitably be carried over to other social science areas. Surprisingly the authors in the main achieve their objective as dispassionately as though they were presenting data on the wasps that earlier occupied Dr. Kinsey's attention.

The book is divided into three parts. History and Method, the first part, is presented in four chapters that merit careful reading as lessons in scientific methodology. Contained in the first chapter are the general sources of the data. These were derived chiefly from persons who volunteered as subjects. These persons (12,000 contributed) are predominantly drawn from the states of Indiana, New York, Pennsylvania, Illinois, Ohio, and other Eastern states. Each state in the Union is represented by at least a few persons. The authors point out the obvious need to spread the sampling more widely. In addition to the tendency for geographic concentration, the sample includes a markedly disproportionate number of professional and urban subjects. These sampling defects are partly corrected by the use of U. S. census correction factors but it is likely that some resultant data are not as entirely representative as if the sample itself were properly balanced.

Relative to the fact (clearly developed by the authors) that the sample is not representative, it is unfortunate that so much of the later writing involves interpretation that permits the reader to infer that the sample is satisfactory. The authors also fail to develop the fact that the sample is at most referable to the United States.

Chapter 2 is chiefly devoted to discussion of the interview methods used in the study. The interviews should be classed as information-getting in type and the description of the technic sounds convincingly effective for the kind of subjects used.

* Sexual behavior in the human male. Alfred C. Kinsey, Wardell B. Pomeroy and Clyde E. Martin. Philadelphia-London: W. B. Saunders, 1948. Pp. xv+787. (Illustrated.) $6.50.

On the other hand, such rapid-fire methods may prove to make the experience abhorrent to many prospective subjects and further distort the sampling. The authors make rather flat statements that these personal interviews are the best way to get complete information in particular contrast to all forms of questionnaire procedures. No data are cited on this point and there is probably basis for disagreement.

The third and fourth chapters treating with statistical methods and validity are also well done. They constitute a short, readable treatise of general applicability. One important issue is discussed that readers should consider carefully. It is the naive concept of many persons that samples with large numbers of cases in them are automatically representative as well as being reliable. As is pointed out in Chapter 3, the best technic of sampling for data of this type is stratified sampling where adequate numbers of each of specified types of persons are obtained with partial or hundred per cent sampling. This theoretical discussion is excellent but the data on the outcomes are a little disturbing. Most of the figures of the report are based upon stratified samples composed of persons who volunteered or yielded to mild pressure to give their histories. In all, only 26 per cent of the data are from hundred per cent samples (groups of persons where every member contributes his history). Furthermore, the hundred per cent samples that were obtained are mostly professional level groups that are not even representative of a whole college population.

In the data presented, showing relative figures for the hundred per cent groups contrasted to the partial samples used for the tables of the report, fairly large differences can be found. It is interesting that these differences are in the general direction of less frequent occurrence of various more socially rejected sexual activities as one progresses from nocturnal emissions (no appreciable difference) to homosexual activity (Table 3, p. 94). According to the figures given, the incidence of homosexual activity as indicated in the partial sample data used for the body of the report exceeds the hundred per cent sample data by 26, 39, and 83 per cent for the three age groups given.

These differences are not negligible. They are here presented in a way that overemphasizes them, but the opposite is true in the treatment of the same point by the authors. The authors show concern regarding the point but choose to use large number data rather than restrict the findings. They conclude, "Whenever, as in the present survey, it is not feasible to secure a strictly randomized sample, a combination of hundred per cent sampling and controlled partial sampling seems the best that can be done. To attempt to base the entire study on hundred per cent sampling would not be satisfactory, for it would be impossible to secure such complete samples in sufficient number from all of the diverse groups in a population. Sufficiently controlled partial samples seem to have considerable value, especially when they are offset by an even greater proportion of hundred per cent samples than we have, as yet, utilized" (p. 104). While their choice is probably proper under the circumstances, readers should be aware of the possible overestimations.

It will be disturbing to many that the figures in this first report are almost wholly concerned with the methods by which the males achieved ejaculation and with the frequency of ejaculation. Obviously ejaculation and its immediate precursor behavior do not constitute all of sex behavior even in the male. It is certainly to be hoped that a similar volume on the female will be more broadly based than upon the female orgasm which is a much less important event than is ejaculation for the male.

Part II consists of nine chapters treating with factors affecting total sexual outlet. "Total sexual outlet" refers to the total weekly ejaculation frequencies without regard to the manner of their occurrence. The total sexual outlet of 22.5 per cent of males during the most active sexual period is reported as 1.0 or less. Nearly 2 per cent have no ejaculations. On the other end of the same distribution 21.3 per cent of the group average more than 4.5 total outlet. About 2 per cent average more than 16.0 (Table 40, p. 198, adolescent to 30).

From ancient time men have been interested in tales of superior sexual achievement. This is true

today. Reading this book many will, with difficulty, derive a balanced knowledge, with adequate recognition of the facts it contains regarding low levels of sexual drive as well as those concerning high levels. It is unfortunate that so many professional workers consider low sexual activities to be prima facie evidence of maladjustment and neurosis while regarding high sexual outputs as clearly normal or as of criminological interest only. The point is aptly illustrated by the authors, "There is an inclination among psychiatrists to consider all unresponding individuals as inhibited, and there is a certain scepticism in the profession of the existence of people who are basically low in capacity to respond. This amounts to asserting that all people are more or less equal in their sexual endowments, and ignores the existence of individual variation. No one who knows how remarkably different individuals may be in morphology, in physiologic reactions, and in other psychologic capacities, could conceive of erotic capacities (of all things) that were basically uniform throughout a population. Considerable psychiatric therapy can be wasted on persons (especially females) who are misjudged to be cases of repression when, in actuality, at least some of them never were equipped to respond erotically" (p. 209).

To use a line of argument common to the book, professional workers concerned with sexual pathology are likely to derive some of their interest in this field from their own personal histories of sexual frustration. Appropriate to their superior intelligence level the imaginative and general verbal excitants to sexual readiness are strongly developed. "The use of literature and erotic pictures for stimulation during masturbation is not really common, and *it is largely confined to better educated individuals*" (p. 510, italics added). This characteristic makes the better educated male with average or above sexual drive and with inhibitions derived from his cultural level fall easy prey to a projective mechanism by which others become like himself. Freudian psychology, largely a psychology of the educated class, is permeated with such errors and is increasingly incomplete as its principles are applied to people of lower intellectual abilities.

As is repeatedly emphasized in the text, the chief determinant of total sexual outlet is age. The mean frequency curve of total outlet is at its highest observed values (11.3 maximum) during the ages adolescence to 30. From the latter age it drops smoothly into old age. It is interesting that the authors are convinced that the real peak of potency is reached shortly following adolescence. The actual frequency of ejaculations is nearly as high at this period as at later ages in spite of the difficulties encountered in social attitudes directed against sexual behavior in the teenage unmarried male.

Religious status is indicated as another major factor affecting total outlet. "The differences between religiously devout persons and religiously inactive persons of the same faith are much greater than the differences between two equally devout groups of different faiths. In regard to total sexual outlet the religiously inactive groups may have frequencies that are 25 to 75 per cent higher than the frequencies of the religiously devout groups. Among religiously inactive males there are definitely higher frequencies of masturbation, premarital intercourse, marital intercourse, and the homosexual" (p. 486).

Among factors affecting the pattern of total outlet as distributed among the nine categories (nocturnal emissions, masturbation, marital intercourse, animal, etc.) the most powerful is social level. For example, although the total outlet levels are not markedly different, the relative use of solitary and homosexual sources vary greatly. Among single males, age 16-20 and educational level 0-8 years, solitary outlets average only 33.98 per cent of total in contrast to 82.02 per cent of total among similar males of 13+ schooling. On the other hand, heterosexual outlets account for 58.49 per cent of the total for the lower educational level contrasting to only 15.19 per cent among the college level males (Table 96, p. 378). Throughout the data, there is evidence that the higher level males are more averse to irregular heterosexual relations and resort to solitary outlets as a substitute. These data are emphasized by the authors as indicating the necessity for upper level persons to readjust their concepts of the frequency of occur-

rence of premarital and extra-marital heterosexuality among males of lower school levels.

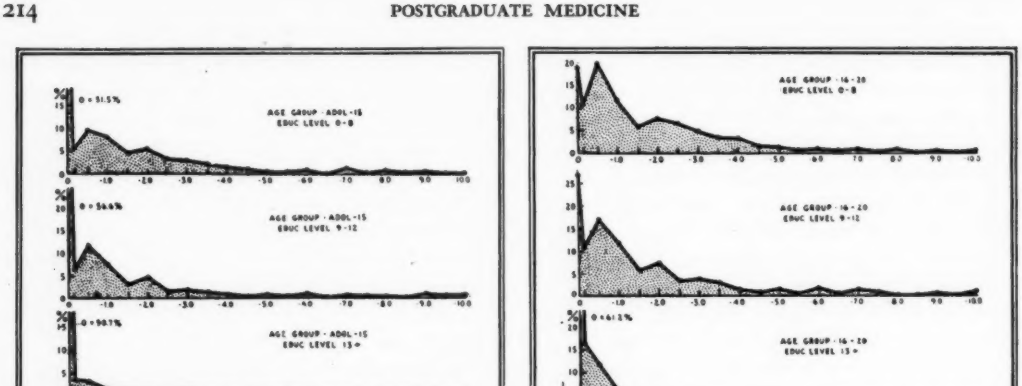
Part III treats individually with the nine sources of sexual outlets. Possibly the best single summary of the data is given in Figures 126-133 (pp. 488-493). These figures show an overwhelming percentage of sexual outlet in all groups of males to be concentrated in sexual intercourse and masturbation with variation in the relative amounts of each. The variation is most closely related to marital status and education level. There are comparatively smaller but significant amounts of homosexual and nocturnal emission outlets that appear more among single males.

In their introduction to the chapter on masturbation, the authors say, "When so strictly defined, masturbation cannot be taken to be as universal as some of the psychiatrists and psychologists would have it. The extension of the meaning of the word has, unfortunately, distorted the interpretation of the actual data on the phenomenon; and it is to be suggested that the analysts would do better to describe a good deal of what they observe, especially among younger children, as tactile experience, which is exactly what it is, and not call it masturbation until there is evidence that the child is reaping an erotic reward for his activity, and that the behavior has been inspired by some anticipation of such a reward" (p. 498). As indicated by their figures (Table 132; p. 500; U. S. Pop.), the top percentage of males with masturbatory experience is about 92 per cent. This percentage is reached by age 17 and remains rather constant for all older males. Even for married males of ages 51-55 the percentage of incidence is about 1 in 10 (Table 51; p. 241; U. S. Pop.). Among the upper education level males these percentages are larger.

Regarding personal advice on this subject, as such advice is too often given, the authors state, "The boy is advised that a limited amount of masturbation may do him no harm, but that in excess it is something which needs the attention of a physician. Since the point at which excess begins is never defined, the conscientious boy is left uncertain whether his own rate is going to harm him; and psychiatrists will quickly recognize that such subtle and indirect condemnation can do as much damage to the boy's personality as the more extreme teaching of the older day. One needs to be reminded again (as in Chapter 6) that there is tremendous individual variation in the human male's capacity to engage in sexual activity without undue fatigue or other physical harm. Some individuals reach their limits when they experience orgasm once in a week or two. The average adolescent boy is quite capable of three or four ejaculations per week, and there are boys who are capable of seven to fourteen or more per week without incurring any greater disturbance than that which accompanies the infrequent activities of less capable males" (p. 515).

PREMARITAL petting is reported as an important outlet for upper educational level males. The incidence percentage for climax from petting among these males reaches about 60 per cent by age 25. (Only about 17 per cent for corresponding lower level males.) (Table 135; p. 536.) The authors emphasize the social significance of these facts, but seem rather unclear as to the meaning of their data. They say, "Specifically, the sexual factors which most often cause difficulty in the upper level marriages are (1) the failure of the male to show skill in sexual approach and technic, and (2) the failure of the female to participate with the abandon which is necessary for the successful consummation of any sexual relation. Both of these difficulties stem from the same source, namely, the restraints which are developed in premarital years, and the impossibility of freely releasing those restraints after marriage. On this point Freud, the psychoanalysts, and the psychiatrists in general are largely agreed. On this point, our own data provide abundant evidence" (p. 544). In general, they imply a distinct approval of petting to climax as a positive factor in marital adjustment. The data justifying such a stand are not presented. Even though data were presented showing the sequence to be, petting experience—good marital adjustment, this would of course not establish a causal relation. Ultimately these data like their other taxonomic data will need research to permit interpretation of the figures.

The data on petting are probably exclusively characteristic of the U.S.A. Many other cultures virtually preclude the occurrence of such behavior.



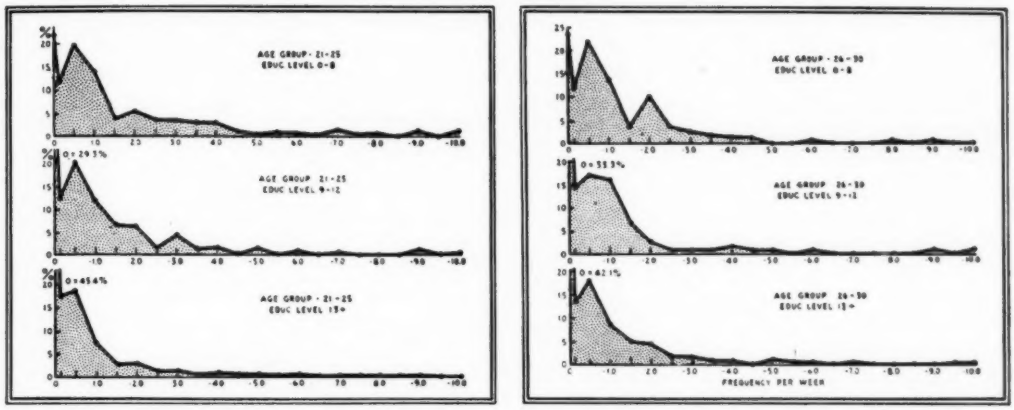
Reproduced from: Sexual Behavior in the Human Male.

Premarital intercourse with companions; individual variation in frequencies, at ages adolescent–15 and 16-20, for three educational levels. Showing per cent of each population (vertical line) which engages in premarital intercourse with companions with each type of frequency (horizontal line).

As INDICATED in the charts at the opening of Part III, heterosexual intercourse is the chief outlet for all younger males and for married males of any age. Two quotations may perhaps represent the very valuable data on the general subject at least as related to extramarital relations. "For most males, at every social level, extramarital intercourse is usually sporadic, occurring on an occasion or two with this female, a few times with the next partner, not happening again for some months or a year or two, but then occurring several times or every night for a week or even for a month or more, after which that particular affair is abruptly stopped. The averaged data may show mean frequencies of once a week or two, but the whole of the year's total is likely to have been accumulated on a single trip or in a few weeks of the summer vacation" (p. 588).

"The human female is much less interested in a variety of partners. This is true in her premarital and extramarital histories and, again, it is strikingly true in her homosexual relations. The easy explanation that the female is basically more moral, and the male less moral, does not suffice. These differences must be more dependent upon differences in the sexual responsiveness of males and females, and particularly upon differences in the conditionability of the two sexes. The average female is not aroused by nearly so many stimuli as is the male, and finds much less sexual excitement in psychic associations or in any sensory stimulations outside of the purely tactile" (p. 589).

It is especially noteworthy that prostitution seems to play a small part in heterosexual activity even among single males. "The mean frequency of prostitute contacts for the entire male population of all ages and of all educational and occupational groups is 0.093 per week, or approximately 5 times per year" (p. 353). Also, "For an activity which contributes no more than this does to the sexual outlet of the male population, it is amazing that it should have been given such widespread consideration" (p. 605). A particularly good point made in discussion is, "The exclusively homosexual male, however, is not the person to be helped by a prostitute. There are numerous histories of such males being advised by clinicians, or led by some friend, or forced by some hilarious group of male companions into attempting intercourse with a prostitute. In a high proportion of such cases the male proves impotent, and his psychic problem is thereby intensified. Even when



Reproduced from: Sexual Behavior in the Human Male.

Premarital intercourse with companions; individual variation in frequencies at ages 21-25 and 26-30, for three educational levels. Showing per cent of each population (vertical line) that has premarital intercourse with each type of frequency (horizontal line).

the intercourse is more or less successful, it is likely to prove distasteful because of the unesthetic conditions under which it is had. The introduction of the homosexual male to heterosexual experience should come through friendships which lead to affection and spontaneously erotic developments" (p. 608).

There are many very important data regarding the homosexual outlet. Among the introductory points made is the statement, "A more elaborate presentation of our data would show that there are a great many males who remain as masculine, and a great many females who remain as feminine, in their attitudes and their approaches in homosexual relations, as the males or females who have nothing but heterosexual relations. Inversion and homosexuality are two distinct and not always correlated types of behavior" (p. 614). Further on in rejecting a useful relationship between homoerotic trends and hormonal balance, the authors state, "There is clinical experience with the human male which similarly shows that the intensity of his sexual activity is increased when male hormones are administered, while his choice of a partner (*i.e.*, his heterosexuality or his homosexuality) is not modified" (p. 615).

THE accumulative incidence of homosexual experience for the U. S. population is estimated as about 37 per cent maximum which value is reached by age 19. For the partial samples of lower and higher educational level males this figure drops to about 29. With homosexuality it is the males of high school level who seem to show the greatest incidence. Of course the figures for single male subgroups run larger, reaching as high as 50 per cent. Naturally these data indicate only the taxonomic fact of homosexually elicited ejaculation and do not necessarily reflect the psychologic nature or preferences.

After a clear and logical presentation of the reasoning leading to the statement that ". . . it becomes obvious that any question as to the number of persons in the world who are homosexual and the number who are heterosexual is unanswerable" (p. 650), they give data arranged in scale form that show the percentages of males with various degrees of involvement. It seems that in the placement of persons on this scale the authors departed from the taxonomic method. They say, "It will be observed that the rating which an individual receives has a dual basis. It takes into account his overt sexual experience and/or his psychosexual

reactions. In the majority of instances the two aspects of the history parallel, but sometimes they are not in accord. In the latter case, the rating of an individual must be based upon an evaluation of the relative importance of the overt and the psychic in his history" (p. 647). The interviewers appear to have been making judgmental decisions! At any rate, from these data they conclude, "8 per cent of the males are exclusively homosexual (*i.e.*, rate a 6) for at least three years between the ages of 16 and 55. This is one male in every 13" (p. 651).

A significant statement is made in general discussion, "The opinion that homosexual activity in itself provides evidence of a psychopathic personality is materially challenged by these incidence and frequency data. Of the 40 or 50 per cent of the male population which has homosexual experience, certainly a high proportion would not be considered psychopathic personalities on the basis of anything else in their histories" (p. 660).

The whole section on homosexual outlet should be carefully studied since even an extensive review cannot give proper balance to the findings.

The section finally concludes with "animal contacts." While these are found to be more common than many investigators have thought, they are still very limited. In the incidence figures, it is not clear just what the authors counted as an animal contact. Possibly some acts are included that would have very little psychologic significance.

One properly hesitates to express critical evaluations of a report containing so many valuable data. However, since this book is being read and interpreted by thousands of persons who are not experienced in evaluating statistical reports, it seems desirable to at least suggest points that may prove stumbling blocks.

The problem of the hundred per cent samples has been discussed above. Somewhat allied to that is the difficulty the authors occasionally experience with the evaluation of relative differences. For example, "There is much more homosexual activity among males of lower educational levels than there is among males of the college level (Table 90, Figure 105). Within any particular educational level the differences between religious groups are not so great" (Table 131).

"Between grade school and college males of the same religious group there may be a 200 to 500 per cent difference. Between religiously active and religiously inactive groups of the same denomination in the same educational level, the differences are ordinarily not more than 50 to 150 per cent, and sometimes they are not even 10 per cent" (p. 482). The evaluation of significance of differences, such as are referred to in this quotation, properly starts with their statistical reliability and next depends upon the complex backgrounds determining them. A religious belief or any other effect that would reliably decrease sexual activity by 10 per cent over a five year span might be exceedingly important! The data include a bewildering number of such small but reliable differences that may be very profitable initial points for research when we begin to think about them more soberly, and the evaluations of significances of differences as given by the authors should be accepted very cautiously both because of the general complexity of such evaluations and in view of probable distortions of the data from defective sampling.

A possibly severe criticism of the report as a whole is the subtle but unmistakable way in which the authors depart from their early stated and assumed goal of avoiding "social" or "moral" interpretations. On the contrary, there is at least one ever recurring theme that pretty clearly makes social and moral interpretations: laws and social policies regarding sex are old-fashioned and often ludicrous. The implication seems to be that what is statistically frequent should be recognized as right or at least condoned publicly. For example, the widely quoted statement implying that 95 per cent of the total male population could be convicted of a crime (p. 392) disregards the actual functioning of law.

Another example is, "The evidence that we now have on the incidence and frequency of homosexual activity indicates that at least a third of the male population would have to be isolated from the rest of the community, if all those with any homosexual capacities were to be so treated. It means that at least 13 per cent of the male population (rating 4 to 6 on the heterosexual-homosexual scale), would have to be institutionalized and

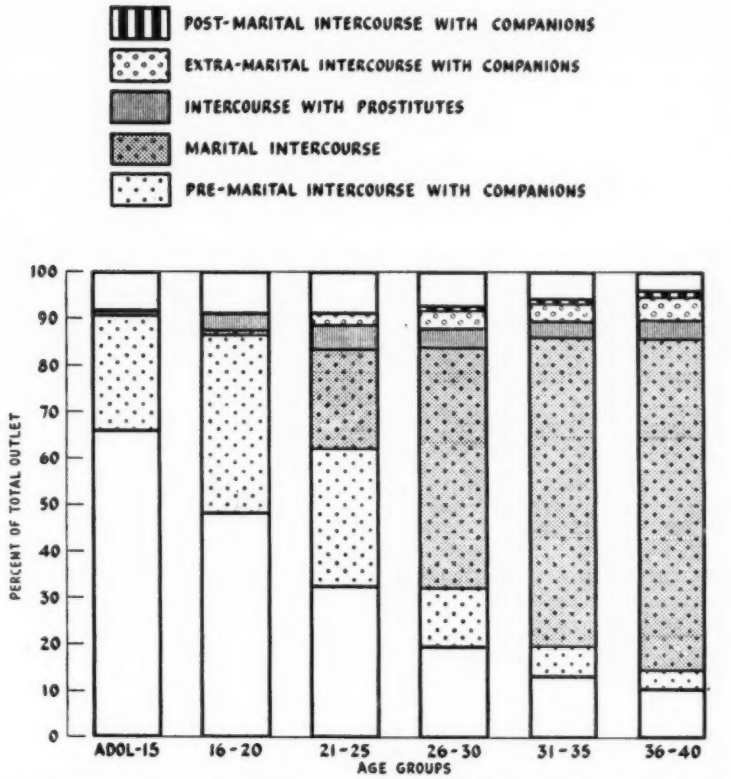


Figure 127. Types of heterosexual coitus contributing to outlet of total U. S. population in each age period

Reproduced from: Sexual Behavior in the Human Male.

isolated, if all persons who were predominantly homosexual were to be handled in that way" (p. 665). To draw an illustration from another field, a very large percentage of males have probably stolen money or objects of value. This must be widely known, and yet almost everyone accepts the laws designed to apply to those who steal *under certain conditions.*

Another example of the same sort is, "When it comes to a question of releasing sex offenders, parole boards are loath to take action. The inmate is judged by the standards of the upper level community from which most parole board members come. Women on prison boards are especially likely to come from a social level where the loss of virginity before marriage is an unforgivable moral offense. The girl whose future they are deciding comes from a community where three-fourths of the girls have intercourse before marriage. Persons who attempt to control the behavior of other persons might more properly be concerned with determining the extent of the departure of the individual from the behavior of the community of which he is a part" (p. 393). Here again the application of our laws is not in practice meant to be a matter of mere occurrence of an act. We judge acts with reference to time, place, persons, and other special circumstances. It would be ab-

surd to try to frame laws specifying how they should be applied. In further regard to the latter paragraph above, the authors have failed to include any tables establishing their evidence and are stating opinions and judgments irrelevant to the chief study they are reporting.

This reviewer has no especial brief to present on the attitude he feels the authors convey against our laws regulating sexuality. Professional workers are usually well aware of the occasional misuse of law in persecution of certain persons 'convicted' of homosexuality and similar socially abhorrent behavior. However, social attitudes and the law derive from very complex origins. One who assumes responsibility for release of a man after *conviction* as a sodomist, is likely to be quite conscious of the fact, also taxonomic, that such individuals are as a group more likely to perpetrate a really severe crime than ones from the non-convicted population. It is likely that criminal proceedings direct attention to the wrong aspects of the behavior but the data in this report do not afford very direct evidence on that point.

There is another subject of more subtle nature on which the authors seem to take an arbitrary stand. Many statements occur that are similar to, "Whether such a program is morally desirable is a matter on which a scientist is not qualified to pass judgment; but whether such a program is physically feasible is a matter for scientific determination" (p. 665). In the use of the word "morally" contrasted to the word "scientist" there is at least an implied subdivision of human behavior into two categories. A similar dichotomy seems to lie in the statement, "The social values of human activities must be measured by many scales other than those which are available to the scientist. Individual responsibilities toward others in the social organization, and the long-range outcome of behavior which represents the individual's response to the stimuli of the immediate moment, are things that persons other than scientists must evaluate. As scientists, we have explored, and we have performed our function when we have published the record of what we have found the human male doing sexually, as far as we have been able to ascertain that fact" (p. 678). It would be maintained by many sociologists and criminologists that there are direct scientific approaches to morality and that much of what constitutes moral law is at least as closely correlated with scientifically observable and measurable phenomena as are taxonomic homosexual incidence data to principles for a successful society. There are other scientific methods than unit counting, however valuable such a method may be.

If there has been more of criticism than of praise in this review, it is not from the reviewer's lack of appreciation of the exceedingly important data it presents nor of the manner of presentation. To be a product of our culture and to write regarding sex almost without bias or evaluative judgment is an achievement that will be so patent to all professional readers that praise is superfluous. And every professional worker who is expected to understand and evaluate human behavior *must* read the book itself.

STARKE R. HATHAWAY, Ph.D., Professor and Clinical Psychologist.
Division of Psychiatry, University of Minnesota.

NOTED SURGEON DIES JANUARY 17th

ROSCOE R. GRAHAM

DR. ROSCOE R. GRAHAM, distinguished Canadian, noted for superb surgery, effective teaching, and humanitarian accomplishments, died instantaneously and unexpectedly about ninety miles north of Toronto on Saturday afternoon, January 17th, while he and Mrs. Graham were about to return to Toronto by auto, following a few hours of skiing with some friends on the Craigleith ski course, seven miles from Collingwood, Ontario. Although it appeared hopeless, Dr. Graham was quickly conveyed to the Collingwood Hospital, but to no avail.

Dr. Graham was 58 years of age. Death was caused by a massive coronary thrombosis. He is survived by his widow, Mrs. Beatrice Barry Graham; a son, Barry, an engineer with the Aluminum Company of Canada, now in Switzerland; a daughter, Mary, Mrs. Peter Allen, who with her husband, is now in Holland; and a sister, Miss Ella Graham, of London, Ontario. Dr. Graham's brother, Dr. Stanley Graham, is Professor of Pediatrics in the University of Glasgow, Scotland. His cousin, Dr. Duncan Graham, up to the time of his retirement last Summer, was Professor of Medicine at the Toronto Medical School.

Dr. Roscoe R. Graham was Assistant Professor of Surgery in the University of Toronto, and held several hospital appointments in addition to that of Senior Surgeon at the Toronto General Hospital. He was a member of all of the important North American Surgical Associations, and at various times was the president of several. In 1940-1941 he was the President of the Interstate Postgraduate Medical Association, on whose programs frequently he appeared and was a most esteemed clinical lecturer with the audiences.

Dr. Graham lived a full life, as evidenced by his enthusiastic interest in golf, hunting, fishing, sailing, photography, and music. The press notices of his passing are in consonance with the comment made by Dr. R. F. Farquharson, Professor of Medicine, Toronto Medical School: "He was a wonderful surgeon. In addition, he was a most virile, active and enthusiastic person, with absolute loyalty to his friends, his university, and the hospital. I cannot imagine getting along without him. He seemed to be in the best condition. He was such a living person that it is difficult to think of him as dead."

JOHN FREDERICK ERDMANN, M.D.

Photo by Frank H. Bauer

Men of Medicine

A Legend In His Lifetime

To very few men is vouchsafed the honor of becoming a legend in their own lifetime. Among those so singled out by smiling Fortune is Dr. John Frederick Erdmann, for over fifty years one of the finest surgeons in that great center of talent and excellence, New York City. And surprisingly enough the ordinarily impersonal metropolis annually recognizes his preeminence by a graceful gesture. Each year Dr. Erdmann's automobile license plate bears his initials on it. So that when there's a sleek black Chrysler bearing the combination J.E.83 drawn up at Post-Graduate Hospital on 2nd Avenue, you may know that the doctor is present, accounted for, and probably operating.

Personally, vigorous stocky Dr. Erdmann regards this legend business as a very dubious distinction at best. "Like the matter of this memorial amphitheatre and bust they dedicated to me at Post-Graduate. Why, it cost me money! Not," he assures you gravely, his tone contradicting the bright eyes twinkling beneath jutting bushy brows, "not that I contributed. Of course not; it's just that people read about it and assumed that I was finally dead! Called up here to offer condolences instead of make appointments. That's how it cost me money!"

Nevertheless, the appointment book still schedules three or four operations a week, and each day brings its quota of a dozen or so patients to be seen at the office and rounds to be made at the hospital. In addition, Dr. Erdmann is today important as a trusted and experienced consultant of many younger doctors. It's because he's still so busy operating and examining patients that Dr. Erdmann scorns to waste valuable time writing his memoirs, and has scant patience with the would-be biographer who tried to prod him into recalling details of the time he was sued for $250,000. Or the time Enrico Caruso's anxious friends wrote threatening letters predicting in vivid terms what immediate and violent end Dr. Erdmann might expect if their beloved compatriot didn't get well at once with his magnificent voice unimpaired. "I just happened to be called in as a consultant by Dr. Murray who was house physician at the Vanderbilt Hotel where Caruso was staying. Then I did operate on him—twice, as a matter of fact—chest and abdominal. Sure, he recovered all right; and then went right back to stowing away enormous quantities of that rich spaghetti that he'd been told to stay away from."

Little wonder that one expects colorful anecdotes and exciting recollections from one whose practice spans half a century of New York history, and whose roster of patients included scores of distinguished names among whom were Grover Cleveland, George Gould, Senator Ahearn, John Mitchell (the Labor Chief), William Brady, George M. Cohan, Al Woods, George Baker, Samuel Untermyer, the Reverend Henry Howard, Irvin S. Cobb. But the man who treated all these people, and so many others that his grand total of operations has topped 20,000, lives in an active present and has no need of turning backward to the past. Essentially, that must be the reason for Dr. Erdmann's continued vigor and the amazing vitality that characterizes him. The years have even streamlined his figure which, though still compactly solid, is no longer "stomachy" as a biographer of twenty years ago termed it. The man gives no impression whatever of a museum piece miraculously preserved into our era, but rather of real assurance, of solidity, of a wise and experienced maturity. Looking at his firm skin, the healthy-looking fringe of white hair edging his bald pate, feeling the reassuring pressure of his hand clasp, and hear-

ing the unmarred resonance of his confident voice one recognizes that this is how men should grow old. There is apparent the appropriateness of a comment by Dr. J. Bentley Squier on his dynamic and socially useful career: "It takes a long time to bring excellence to maturity."

It takes time and it takes single-mindedness of purpose, too. In Dr. Erdmann's long life everything has been subordinated—many interests and desires have been sacrificed to the practice of surgery. Fate, or more probably her light-hearted sister Chance, had a finger in making him a surgeon, too. He recalls with ironic amusement that because he was third in his graduating class at Bellevue in 1887, the appointment to the Third Surgical Division, Bellevue Hospital, automatically fell to his lot. The two men ahead of him, entitled to prior choice, each signed for medical divisions! But he is, indeed, the surgeon, par excellence. A famous contemporary sculptor, Max Kalish, "who has gained fame for his vigorous and sympathetic sculpture of laboring types and wartime notables—now has set himself the task of leaving for posterity a similar record of men in professional fields who are making history —in these stirring and revolutionary times— His first statue of the new series is 'The Surgeon'."

"THE SURGEON"

(Statue of Dr. Erdmann by Max Kalish—first of a series of leaders of their professions.)

For his model in this work he chose Dr. John F. Erdmann, head surgeon of Post-Graduate Hospital.—'The Surgeon' stands in the white working gown of his calling, his thumbs slipped in his belt, revealing as significantly almost as the face, the firm hands that are capable at once of such delicacy and such sureness. It was not by accident, one is sure, that those hands were placed so prominently. They complement and emphasize the character of the vigorous, thoughtful face—the face of one whose everyday problems are questions of life and death. Yet for all its implied seriousness, the poise of the solidly set figure is easy and natural."

Those hands, blunt-fingered, but ever so sensitive and delicate, were once the subject of comment by a New York columnist, for Dr. Erdmann is a figure in New York whose presence is generally noted whether accompanied by Mrs. Erdmann at the opera, or returning

from a summer week-end at his Easthampton estate. So, in a way, Dr. Erdmann accomplishes the almost impossible feat of having his cake and eating it, too. And he still bites into it with relish and gusto! He is and has been for many years, a great surgeon, distinguished by the fabulous Erdmann technic that combines an amazing speed in operating, gained in long practice, with an almost instinctive anatomic knowledge. By constant study and practice these qualities have joined to produce the unerring deftness of his operating procedure. Once when he was asked how so busy a practitioner could possibly keep up with medical literature he replied with a chuckle, "A surgeon who doesn't keep up soon finds he is no longer a busy surgeon." Fairly recently Dr. Erdmann has added novels to his reading diet; "—but not biography! I'm not yet senile enough to turn to biography!"

In addition to being the wonder of his profession, he is a rich man. He has certainly had many legitimate opportunities of becoming so, even though his life-saving skill is not reserved for those patients who can pay well for it. And his financial success is eloquently underlined by the charmingly urbane town house that includes his office and his home. The furnishings are quietly elegant, the decoration sophisticated, combining the treasures of many countries and many epochs. Against pale gray walls hang French versions of English hunting prints, and in the inner office choice Japanese prints by Hashiguchi and Kiyoshi. There's an old gilded French barometer, and a carved Dante chair, black with age, and a softly painted mural of an Alpine fishing village above a sturdy oak bench. *Punch* and the *London News* are shoved in among the periodicals, and so is a current best-seller. The French doors and long windows of the doctor's own office reveal just so much of nature as contributes expensive contrast to a city dwelling.

In a small bricked courtyard, shabby English sparrows sun themselves on the wall or peck contentedly at invisible crumbs spread beneath a vine and tree. A forgotten garden chair and a chubby little bronze boy who undoubtedly spurts water from some unexpected point attest to the memory and hope of summer. Everywhere are cats, sketched, painted, caricatured, sculptured from marble or jade. All of them have been gifts to the doctor; many of them from his three children, recalling the days they clamored for father to draw pictures and he responded with endless variations of his one artistic accomplishment—a fine, well-rounded, long-tailed, flourishing cat! There's a black and white marble floor in the entrance hall, modern mirrors, and decorative grill work on the door through which a well-trained man servant sees the patients out. And glinting in the pale winter sunlight is an unobtrusive brass plate not much bigger than an engraved visiting card—John F. Erdmann.

It's the name that a twenty-three year old youngster from Chillicothe, Ohio, painted on a big sign swinging from a staple in front of his first office on Lexington Avenue. His colleagues jeered good-naturedly that the sign could be seen for ten blocks, but blunt-speaking, hard-working Johnnie Erdmann went on his laborious way, slowly acquiring the knowledge of men and of surgery that was to develop into the spectacular technic that became known as his. He wasn't always as bold and brash as he appeared, nor did he have any entree into the polite world of high fashion and big fees. He worked among butchers, clerks, truck drivers, small tradespeople. He barked at them, bullied them, won their respect. But once, in self-reproach and despair, he retired from the practice entirely. There was a confinement case, breech presentation, in a boarding house. The patient was too poor to have had any previous attention. He delivered the child himself, but strong convulsive pains resulted in a fracture of the scapula and the death of the patient. The young doctor packed up his instruments ready for sale, wept bitter tears, and slept fitfully until dawn. Morning brought a shining sun, a returning flood of cheerfulness, and a disposition to take inventory—one diploma in

medicine, one diploma for eighteen months' service at Bellevue Hospital, no avocation, no ability for anything at that time. By noon young Erdmann returned to medicine. And for the next few years he doggedly followed a hard, uphill road.

LOOKING back at those years from his comfortable eminence at Post-Graduate Hospital, the doctor can be gay and gossipy. He recalls the exuberant administration of anesthetics during his internship when "most of our patients were truck drivers, wharfmen, and the like with strong whiskey, gin, or tobacco breaths. We would clap a boot-leg cone or a lamp chimney cone over the face and push the anesthesia until the patient was deep blue—." Perhaps deep blue unconsciousness was just as well, for Dr. Erdmann recollects further: "Our favorite indoor sports in those days were operating for hernia, breaking legs and thighs for bow legs, knock-knees, tying off hemorrhoids, opening psoas abscesses, subcutaneously operating for varicose veins, scarifying and chiseling osteomyelitis, traumatic amputations, trephinings for injuries, lifting breasts off for carcinoma, and putting up fractures.

"Caesarean sections were done three times in my eighteen months in the service with 100 per cent fatality. Thyroid operations were preceded by doses of opium or digitalis or both. In many cases a resection of the entire gland was done. The operation was a very easy one —a complete resection of both lobes and isthmus, with the usually speedy outcome—death within twenty-four hours."

He watched and participated in the development of methods of asepsis from the time when surgeons wore tail coats and rubber aprons and got their horsehair by going out to the ambulance stable and pulling out a handful from the tail of one of the horses to the present day with its top-to-toe sterile white. In the early days he often operated alone or with the impromptu help of a relative or bystander. Dr. Erdmann was justifiably proud of the equipment that he brought to the scene: a superb folding operating table (the invention of Dr. J. Bentley Squier), a coffin-shaped metal sterilizer in which to boil his instruments, piles of sheets, dressings, white cotton gloves. Rubber gloves were an innovation for which Dr. Erdmann gives credit to the late Dr. W. S. Halsted of Johns Hopkins who thought them up to protect the hands of a pretty nurse he later married. The hand-washing then in vogue, making use of chloride of lime, carbonate of soda, was so rigorous as to remove the skin from doctors and nurses alike. As for the patient, he was scrubbed and poulticed day and night with everything from alcohol and green soap to bichloride solution and carbolic-soaked towels.

More than once he operated by the light of kerosene lamps. Once, when he removed a large gallstone and an ovarian tumor from a seventy-year-old woman, they happened to be acetylene-burning auto lamps. On another occasion he set up his collapsible table under an apple tree in an orchard, and for years received on the anniversary of the operation grateful letters from the "apple tree patient." Dr. Erdmann was also in attendance when, fifteen years before his death, President Grover Cleveland secretly had a cancer removed from his upper left jaw. The salon of the yacht *Oneida,* anchored far down Long Island Sound, was the setting for that operation. The President sat in a chair, the doctors tied aprons over their formal street clothes, but they did boil the instruments.

Small wonder that with such experience in his background coupled with a phenomenal knowledge of anatomy, Dr. Erdmann has for many years been a revered teacher, first at Bellevue Hospital and Medical College, later at New York Post-Graduate Medical School and Hospital. Something of the domineering quiz master manner is an ingredient of his professional behavior that astonishes and delights a rich clientele as it once brought to heel the Third Avenue patients who didn't trust a doctor who was soft with them. It has been said that he has always been too busy to cultivate the suave manner of a fashionable doctor. It has even been insinuated that his bluff lack of ceremony,

his occasional bullying have been cultivated for their novel appeal to people unaccustomed to such treatment. That's a superficial view of what is actually a manifestation of a deep-rooted strength that gives reassurance and confidence to those who are unsure, troubled, ill. Part and parcel of his way of handling patients are his glance at the chart, casual questions about their feelings, his not particularly funny jokes. What has been accomplished by such an unspectacular procedure is actually an interchange. To the patient there comes hope and a lifting of the spirit miraculously translatable into physical improvement to be noted on next day's chart. But Dr. Erdmann's particular brand of magic dissipates worry; he does not make of it a burden for his own sturdy shoulders.

THIS atmosphere of confident vitality is as unteachable as are "his bleak punctilios with scalpel and artery clips," as peculiarly his own as the amazing visual memory that enables him to tell old patients not merely their names, but what hospital rooms they occupied, which way the windows faced! This gift must have helped him to acquire his precise consciousness of human muscles, nerves, blood vessels, their location, their pathology, their actual appearance deep in the human body. Such almost intuitive grasp of anatomy is one of the factors that contributes to his incredible speed and sureness in operating. So unfailing are those qualities that Dr. Erdmann could afford to make public note of the exceptional instance when he lacked them. After his usual greetings to the assembled throng—he always gives a special word to the doctor who has referred the patient—he opened up the abdomen of the patient, a woman, from top to bottom with one neat slice. Then this four-minute man proceeded to probe about in her vitals for a sensationally long twenty minutes. At the end of that time he looked up brightly and confessed without embarrassment, "Dammit all, I can't seem to get oriented here."

Jealous colleagues have a facile explanation for that preternatural quickness that is native to Dr. Erdmann. "Heavens! He *had* to be quick! Anesthesia was so poor when he started operating that the patient would die if he wasn't quick." Students of his are more generous and more clear-sighted in ascribing it to ability developed by experience. At the rate of four or five operations a day, a thousand a year, one accumulates vast amounts of experience. Dr. Erdmann was still operating, albeit at a reduced tempo, when his eightieth birthday came within hailing distance. Unfortunately none of his patients seemed to require surgery at the moment, and it looked as though the precedent of a least one operation on his birthday, a custom observed for fifty-seven years, was about to be shattered. Fortunately there appeared in his office a young lady with a stomach ache who needed an intestinal resection. Erdmann did it on the morning of his birthday, his record was saved and so was the patient. In fact, the operation was definitely a humdinger!

It was on that occasion, too, that there came to Dr. Erdmann, who has always valued his role as teacher, letters from his boys all over the country. There were, indeed, even though it was a war year and many young men were overseas, letters from all but two of the forty-eight states. Thousands of youngsters to whom he had taught surgery and demonstrated the art of operating had gone back to their home states to become chiefs of clinics, heads of hospitals, practicing the technics they had learned from him. He was for twenty-six years professor and for nineteen years director of surgery at New York Post-Graduate Medical School, just as he was for decades consulting surgeon to a score of New York's best known hospitals, and The surgeon to a whole generation of notable New Yorkers.

The letters from the men in Ohio must have had a particular significance for the man in the handsomely appointed office just off Park Avenue. It was in Cincinnati, Ohio, that John Frederick Erdmann was born, and in Chillicothe that he spent his remarkably brief boyhood. "That all ended for me when I was

fourteen and a half and had been to high school for two years. I got a job in a dry goods store. Worked fourteen hours a day and nearly suffocated besides. I wasn't a very tall kid and I had an awful time with those bales from the Wamsutta cotton mills that were bigger than I was. Struggling with one of them in the basement one day I fell into the thing and was pretty near asphyxiated when a man came charging down from upstairs to see why that fool boy wasn't working."

BEFORE long that job was succeeded by one as bottle washer to a pharmacist. The drugs fascinated young John and he became a licensed pharmacist in 1884 just a few months before the law requiring four years' apprenticeship was passed. For three summers in Chillicothe he studied medicine with Dr. Rufus B. Hall as his preceptor. In the spring of 1884, having won a competition, he entered Bellevue Hospital Medical College for a three years' course of study.

Immediately upon graduation in April, 1887, he became acting House Surgeon as the other two seniors appointed to the staff were ill or on vacation. Within the first week he was presented with the case of a gunshot wound back of the right ear and above the mastoid. The patient was a boy who had been caught stealing fruit and was shot by the storekeeper. The problem filled the youthful surgeon with consternation, but he was already developing what have been referred to as "two of the steadiest hands in the business" and the operation was successfully performed. So, many years later, was another operation on a patient suffering not from one, but from half a dozen bullet wounds—the notorious gunman Monk Eastman. At Gouverneur Hospital where the gangster was hospitalized, Dr. Erdmann became used to the friendly but anxious greetings of the cops. "Hi, p'fess'r. Try to fix that guy up, will ya? He's no good, but we don't want to hang the poor dope of a saloon keeper who shot him."

Dr. Erdmann fixed him up with such thoroughness that before long he was out shooting up the town again, and the disgusted cops went around wishing they hadn't urged the solidly built capable little doctor to pass a miracle on a bullet-ridden, barely breathing body.

Back in his early days at Bellevue he first appeared as a medical expert for the legal firm of Howe and Hummel. The middle western boy was dazzled by the twenty-five dollar fee paid him for an hour's testimony, but he ruefully recalls that very little of the money stuck, as it was the jolly custom of the day for such windfalls to be shared among the interns and drunk up as rapidly as possible.

There was less beer and skittles, more problems to be faced when his service as House Surgeon was completed in October, 1888. With both hands infected with boils the young doctor set out to look for a room only to run into the housing shortage of the buyers' season. In a hotel on Forty-second Street he made do for the night with a cot bed, one of eight, in the reading room. After a vacation in his home town he returned to New York to serve as assistant, without pay, to Dr. Joseph D. Bryant, Bellevue's Professor of Anatomy, the same man who later operated on President Cleveland. For Erdmann housing was still a problem. He engaged a room to serve as combined living quarters and office, using the then conventional folding bed as a bookcase and instrument cabinet during the day. He began the practice of medicine; he assisted and quizzed at the College. To consort with his new dignity, he grew a beard!

Perhaps from that period dates the brusque speech, the hectoring questions, the outspoken frankness. More probably these qualities were a legacy from his family, plain people in the merchant tailoring business. A more valuable heritage from them is good health and longevity. Only once has the doctor been seriously ill, in 1930 of a kidney stone. Like most doctors he made an unruly and irascible patient, horrified of hypodermics, averse to morphine, loath to surrender himself to the care and judgment

Photo by Steichen

DEMONSTRATING THE "ERDMANN TECHNIC"

of others. Fortunately, treatment and medication dissolved the stone, leaving Dr. Erdmann still unopened and in no position to join with Irvin Cobb, one of his patients, in *Speaking of Operations*. The two men used to go deep sea fishing together, however, a sport which in earlier years the doctor followed with gusto from Maine in summer to Florida in winter, with additional trips to Canada for salmon fishing. More recently during the summers he has enjoyed a prosperous, gentlemanly life at his estate in Easthampton, driving back to New York to meet the demands of his practice. But calisthenics, which he doesn't do, and his abstinence from tobacco and alcohol which is more of a habit than a fetish, are not the factors to which Dr. Erdmann attributes his more than four score years. "I just happen to come of a long-lived family," he states calmly. "My father lived to be eighty-two or three. Had uncles, cousins, aunts who made the same kind of record. That's all it is—genes."

Perhaps a knowledge of how to meet life and get the most out of it came in his genes, too. Certainly he has the secret. There were years of rigorous effort, slow but steady progress while he laboriously assimilated into his brain and nerves and muscles the ingredients of the preternatural skill and lightning response that became a hallmark of his excellence. He even trained himself to ambidexterity. No vacation at all for thirty years, then

strenuous sports in the company of the wealthy and the celebrated. Back rooms, make-shift furniture, shabby hand-me-downs for an obscure youth; then the smartly distinguished background, the clipped box hedges of a gentleman's estate, the flecked tweeds and carefully chosen shirts. But the good doctor's clothes, although impeccable, are far from quiet. He hasn't outgrown the nickname, Red Necktie Johnny, affectionately bestowed upon him long ago when as a brash youngster he bolstered his ego and cheered his patients by his flashy neckwear. Even now it's not unusual for him to turn to his appreciative secretary with a twinkle and a sly inquiry, "What was I wearing yesterday, Miss Taylor? Can you tell me?" Perhaps it was the pin-striped brown flannel with a pastel shirt and a tie depicting a particularly colorful species of flying fish; or the dark gray mixture with a shirt boasting hairlines of both red and blue repeated in a new pattern from Sulka's. In any case the discussion is a congenial one, and the doctor's sartorial splendor has been noted. The final touch is ordinarily provided by a fresh flower that invariably finds its way to a patient before his rounds are finished. There's a well founded suspicion at Post-Graduate that he deliberately gives away his boutonniere on each floor so that the nurse on the next floor can have the pleasure of presenting him with a fresh one. And so that Dr. Erdmann will have the pleasure of accepting!

THE doctor claims to have no superstitions at all. "Oh, perhaps a little salt over the left shoulder when it's spilled between friends. You'd do the same yourself, wouldn't you? But take 13's now. I like the 13th—and Fridays, too—find them excellent. Matter of fact, I started practice in this house on the 13th. Moved in on Columbus Day and started seeing patients in the middle of boxes and barrels next morning. And that was thirteen, no fourteen, years ago, in 1934. My friends tried to talk me out of moving from W. 52nd Street and rebuilding this house from the ground up. Kept reminding me I was seventy years old; said I must be crazy. But I didn't take any stock in their opinions. I told them that if it pleased Mrs. Erdmann and if we lived here happily for a year or so, it would pay for itself and be fine with me. Well, we've been here going on fourteen years." The eyes beneath the bushy brows surveyed the room with its friendly mixture of office necessities and artistic treasures. His gaze shifted to the charming little courtyard. He smiled, humorously, appreciatively.

Dr. Erdmann's views on the varieties of patients reveal him as a shrewd psychologist. "In the end it boils down to two kinds. There are those who come running to the doctor with every ache and pain. They expect him to hold their hands and murmur sympathetically while they whine complaints into his attentive ear. Sometimes all they need to have removed is a slice of their husband's income—and then again," a wide, warm smile broke through his disgust, "sometimes just a big bunch of violets'll make a woman feel a whole lot better." There's evidence of method behind the doctor's habit of leaving boutonnieres for unhappy patients.

"And then there are the ones who want to be bullied, dictated to with no damn nonsense about it. They're easy enough to handle."

"But, Dr. Erdmann, aren't there any *good* patients?"

"Of course there are." The short solid man behind the broad cluttered desk wrinkled his forehead and pondered judiciously. Then he announced thoughtfully, "Good patients are those who are relaxed—relaxed mentally and physically."

According to that criterion Dr. Erdmann should have a preponderance of the good kind for his thousands of patients cherish a faith in his wisdom and ability that lifts the weight of worry from their own hearts. For his part, the blunt stubby vital doctor merits their confidence and esteems it his special pride to have been The Surgeon of a whole generation in the biggest city in the world.

L. C. DEINARD.

EDITORIALS

CARE OF THE UNCONSCIOUS PATIENT

THE MEDICAL profession and many individuals associated with the police or fire departments of the average town are required to treat persons who, for some reason or other, have been rendered unconscious.

I am reminded of an incident on a Staten Island ferry during the war in which two young ladies who had been trained as Nurses' Aids in the War Emergency Service quickly came to the aid of an elderly woman who was attacked by convulsions and was totally out of touch with her environment. The one favored the use of a mouth gag, advising that the patient be turned on her side, to remain where she fell. The other violently urged that the poor woman be drowned with a glass of water, that her head be held high and her tongue be permitted to obstruct the air passages to the lungs, and last, that an oxygen tent be rushed by special carrier to a moving vessel in the middle of New York harbor.

Indeed, the handling of the many people who become unconscious is often in the hands of those who scarcely know what to do for them, but instinct may assist in the summoning of a physician or nurse.

Certain fundamental principles and objectives in the management of the unconscious patient are to be commended, even though the manner in which they are achieved is not always the same. Virtually all authorities agree on the following important measures for the guarantee of proper attention:

1. Maintenance of adequate airway.
2. Treatment of shock.
3. Careful observation and examination of the patient so that surgical emergencies will be recognized early.
4. Constant and good nursing care.
5. Control of convulsions or restlessness by sedation, if necessary.
6. Control of body temperature.
7. Maintenance of fluid balance and nutrition.
8. Control of intracranial pressure.
9. Early exploratory trephination.

The immediate problem associated with the unconscious person seems to be the establishment of proper airways. The tongue may drop back into the throat and obstruct the air passages, and the simple procedure of turning the patient on his side may be all that is necessary. The aspiration of mucus and saliva by means of catheter and aspirator may prevent pneumonia or atelectasis. Elevation of the foot of the bed also will allow secretions to run out of the mouth.

When the trachea or pharynx has been damaged, and often in the case of badly fractured jaws, tracheotomy may be a lifesaving measure. If the patient is cyanotic, oxygen therapy is recommended, to be administered by means of a face mask, with the rate of flow set at 6 to 8 liters per minute. In injuries of the head, oxygen may be of valuable assistance in the reduction of cerebral edema and intracranial pressure.

Shock is always a matter of utmost importance to the clinician. An over-all picture of the condition of the patient may reveal more important evidence of trouble than does the recognition simply of those factors which made him unconscious; therefore, control of hemorrhage, splinting of fractures, use of intravenous therapy and

the application of heat to the body play the same role in the case of the unconscious patient as in those persons who are shocked but can tell us where they have pain.

Prophylactic measures for tetanus and infection with species of Clostridium must not be overlooked. When obvious leakage of cerebrospinal fluid from a wound is encountered or when penetration of a viscus is noted, chemotherapy should be started early.

Many patients who are unconscious may be extremely restless. The condition of some may be readily controlled by catheterization of the bladder. It is best not to restrain a restless patient, but when thrashing about seems detrimental to the patient and there is likelihood of additional trauma, sedation is indicated. The barbiturates, bromides, and paraldehyde are recommended.

Fluid balance and control of nutrition are very important in the care of unconscious patients. When the state of consciousness is impaired for only a few days, the intravenous administration of fluids is sufficient. If the unconscious state is prolonged, a nasal catheter can be introduced into the stomach and a liquid diet, as well as medications, can be given through the tube. Care must be taken to change the tube frequently, so that esophageal ulceration which might arise from the use of a tube over long periods will be prevented thereby.

Careful examination by the physician and expert nursing care are of prime importance. Clinical judgment and palpation often disclose more about a patient's condition than do roentgen rays and laboratory tests. Diabetic, uremic, and alcoholic comas often are confirmed by the results of blood studies. When there is obvious damage to the brain and signs of intracranial pressure, dehydration and spinal puncture may be used.

Hypertonic solutions of sugar administered intravenously or saline solutions given by rectum may improve the general situation. Spinal puncture can be done safely when the initial pressure is reduced only to one half. Subtemporal decompression is not so important today as it was twenty years ago, but it has a place in the control of intracranial pressure. Recognition and appraisal of any signs which would indicate that trephination of the skull is necessary are best undertaken promptly and ought not to be prolonged by watchful waiting.

The brain stem is the seat of consciousness, and it can be disturbed by many pathologic disturbances to harass the individual into unconsciousness. Each unconscious patient is a problem in himself. What would be adequate treatment for one patient would be useless for another. The individual problems and the particular patient concerned require the meticulous care and understanding of the physician, and an arbitrary rule for use in all cases is out of the question. A good physician recognizes complications and has a free range of consultation so that his patient will be treated adequately and so that nothing is overlooked.

G.S.B.

HEREDITY IN HYPERTENSION

NUMEROUS clinicians have referred to the frequency of high blood pressure in certain families, and the tendency of this symptom complex to occur at about the same age in several members of the same family tree. This observation is not new; Morgagni in 1769 referred to a patient who died of cerebral hemorrhage and whose father "had died of apoplexy."

The subject has also been studied by statistical analysis. Among the most interesting of recent contributions is that of Platt. He approaches the question of a genetic factor by considering the evidence required to prove that "essential hypertension" is the heterozygous (or occasionally homozygous) expression of a dominant Mendelian characteristic.

It is extremely difficult to establish such a theory in human hypertension because of the age of onset of identifiable symptoms. What is necessary is to show by valid statistical evidence that where one parent is affected, half of the children develop the disease and where both parents are involved, more than half the children are affected. Also Platt points out that all affected persons should have at least one af-

fected parent, and all children of unaffected parents should be normal.

Platt's report is based on a study of 116 cases, divided into four groups. One group included those in whom the evidence of hypertension in one or both parents was strong or at least was supported by good collateral evidence. The second group comprised those in whom the evidence pointed only to a reasonable probability of hypertensive disease in one or both parents. Group three comprised those cases in which evidence of hypertension in the parents was lacking, and group four included those in whom there was reasonable evidence that neither parent had hypertensive disease.

Analysis of the type of hypertension in these groups and the relationship to possible genetic factors was carried out. About 76 per cent of the cases of "essential hypertension" gave a family history suggestive of hypertension; in only 6.4 per cent did the family history appear to speak against hypertension. In the group of patients classified as "secondary hypertension" (which meant hypertension due to pyelonephritis or other identifiable causes) and in a control group, the family history was against hypertension in 35 and 39 per cent respectively.

CARCINOGENS IN HUMAN TISSUES

FOR YEARS, investigators have sought the causative agents of cancer. Many substances have been found which are thought to be associated causally with the production of human cancer. Chemical studies have revealed that some of these carcinogenic agents are structurally similar to chemical compounds found in normal human tissues.

Human livers from both cancerous and noncancerous persons contain factors which induce cancerous growth in mice. Steiner and his associates found that the livers of noncancerous persons contained much more active carcinogenic agents than did the livers of cancerous individuals, but were unable to explain this.

One of the most interesting results of this work is the finding that the livers of stillborn infants contained carcinogens, indicating the endogenous nature of the hepatic tumor-producing substance. Bovine livers which were used failed to produce carcinogens, but extracts of pork livers yielded neoplasms. Extracts of several other tissues were investigated; only extracts of the spleens of persons who had cancer were found to contain carcinogens.

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This Month in Medicine

TREPONEMICIDAL ACTION OF ARSENIC

Attention should be given the recent finding that BAL, in exerting its antitoxic effects upon circulating and tissue-fixed arsenic, reduces the spirochetocidal effect of the arsenic to an extent that *Treponema pallidum* can continue to live and multiply in the host tissues.

This conclusion is based upon a study of 5 patients with early syphilis, to whom both BAL and oxyphenarsine hydrochloride were administered. In 3 of the cases the destruction of the spirochetes was delayed far beyond the time normally required under standard treatment. In one case *T. pallidum* persisted for eight days. In another case the organisms quickly disappeared from the lesion following the withholding of one injection of the BAL.

Consequently, although BAL is a most useful therapeutic agent in treating arsenic toxicity, one must recognize that antisyphilitic treatment is thereby interrupted.

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DeOreo, G. A.: Suppression of treponemicidal action of arsenic with 2,3-dimercaptopropanol (BAL). Arch. Dermat. & Syph. 56:695 (November) 1947.

PROSTATISM IN HAWAII

The incidence of benign prostatic hypertrophy has been said to vary anthropologically rather than geographically. This observation has been sustained in the researches of Conger, who reports the incidence of this condition among the various racial groups on the island of Oahu.

A series of 172 patients with the diagnosis of "prostatism" was tabulated with reference to racial group. The values so obtained were then compared with the numerical strength of each group on the island. The incidence of prostatism was then computed by determining the cases per thousand males over 50 years of age in each racial group.

The Caucasian race has an incidence of 23.6 per thousand; the Chinese incidence is 11.1; the Japanese 3.9; the Filipino 9.1; the Hawaiian 2.1; and other racial groups have an incidence of 5.6. The values for the Caucasians, Chinese, and Japanese were based on large numbers of individuals and are regarded as significant; the values for the other groups are of questionable significance.

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Conger, K. B.: Racial incidence of prostatism in Hawaii: a report of 172 consecutive cases. J. Urol. 58:444 (December) 1947.

LUNG ABSCESS

Investigators in Budapest and Marseilles, working independently, have succesfully treated lung abscess with penicillin, administered intrabronchially. Rosenthal introduced the drug through a plastic tube inserted into the bronchus, after anesthetizing the pharynx and airpassages. The penicillin reached the abscess cavity by the aid of gravity, the patient remaining in the position of treatment for three or four hours. Doses of 50,000 units were given in this manner; treatment was repeated every two or three days until three to eight treatments were given. Penicillin was also administered by inhalation from an atomizer, doses of 50,000 to 80,000 units being given on the days when the drug was not applied intrabronchially.

Eleven patients were so treated; of these ten were definitely cured. The eleventh patient was 69 years of age, and in very bad condition. He died suddenly during the course of therapy. Rosenthal regards this technic as the treatment of choice in lung abscess. The work of Mattei and his associates was not consulted, but this investigator is said to have performed similar experiments with similarly good results.

SUGGESTED READING

Rosenthal, E.: Intrabronchial penicillin for lung abscess. Lancet 2:829 (December 6) 1947.

Mattei, C., *et al.*: Essai de traitement des suppurations pulmonaires par des instillations endobronchiques de pénicilline. Presse méd. 54:185-186 (March 23) 1946.

ZIPPERED ELASTIC STOCKINGS

One of the many uncomfortable aspects of phlebitis and other conditions relating to venous passive congestion is the pulling-on of the elastic stocking. It is painful and often causes loss of hard-won epithelium. Cogswell, of Tucson, has his patients sew a zipper in their stockings. This obviates the pain and difficulty, reduces the necessity of adhesive tape, makes dressings easy to change.

SUGGESTED READING

Cogswell, H. D.: Zippered elastic stockings. Surgery 22:993 (December) 1947.

POISON OAK DERMATITIS

Ascorbic acid acts to maintain vascular tone. Histamine, on the contrary, when injected into the body, increases arterial tension and capillary permeability. Klasson assumed that poison oak dermatitis is probably due to an overproduction of histamine in the human body. Hence, he reasoned that ascorbic acid should relieve the symptoms of this distressing condition.

Klasson and his associates administered ascorbic acid to 126 patients (soldiers) with dermatitis venenata caused by poison oak. Each of these patients presented manifestations of moderately severe or severe disease. Results were favorable, sometimes startling. The period of treatment was definitely reduced; the average period was five days, the minimum two days, the maximum ten days. Dosage varied with the severity of the dermatitis. The maximum daily dose was 600 mg. of ascorbic acid, divided into two or three portions which were administered at four to six-hour intervals. Intramuscular injection is advised; other routes are less effective.

The prophylactic value of ascorbic acid likewise was tested. Twenty-four men were divided into two groups of twelve each. The men in one group received 300 mg. of the drug by mouth daily, in divided doses of 100 mg. each, during an exposure period of three days. They were checked on the fifth day for signs of poison oak dermatitis. The control group of twelve men received no ascorbic acid, but were exposed to the poison oak just as were the men in the test group.

No cases of dermatitis resulted among the men who had been given the drug; nine of the twelve men who had not received prophylaxis came down with mild to severe dermatitis. These results were repeated with two other groups, except that only 150 mg. of the drug was given; results were similar. The investigator concludes that oral administration of 150 to 300 mg. of ascorbic acid daily, in divided doses, affords protection against poison oak dermatitis.

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Klasson, D. H.: Ascorbic acid in the treatment and prevention of poison oak dermatitis. Arch. Dermat. & Syph. 56:864 (December) 1947.

BRUCELLOSIS

In vitro, sulfadiazine suppresses brucella. So does streptomycin. But neither of these drugs destroys the organism in vivo, thereby controlling the disease, although each has some inhibitory effect. These considerations have led three groups of investigators, independently, to attempt to control human brucellosis by the combined use of sulfadiazine and streptomycin.

Eisele and McCullough used these drugs together in a clear-cut case of brucellosis, which had failed to respond when either of the drugs was employed separately. Clinical improvement promptly followed the simultaneous administration of both drugs; the prolonged septicemia ceased; and for the seventeen months prior to publication of their results the patient did not relapse. The authors, therefore, conclude that the combination of these two drugs constitutes a choice treatment of brucellosis.

Similarly, Pulaski and Amspacher report the successful treatment of 3 patients; and Spink and his associates have found the treatment satisfactory in 9 patients.

SUGGESTED READING

Pulaski, E. F., and Amspacher, W. H.: Streptomycin therapy for certain infections of intestinal origin. New England J. Med. 237:419 (September 18) 1947.

Eisele, C. W., and McCullough, N. B.: Combined streptomycin and sulfadiazine treatment in brucellosis. J.A.M.A. 135:1053 (December 20) 1947.

Spink, W. W., *et al.*: Proc. Central Soc. Clin. Research (In press.)

R. W. C.

AFTER HOURS

By FRANK G. SLAUGHTER, M. D.

DURING the morning, we like to sit down with Mama in the kitchen for "A Cup of Coffee, a Sandwich, and You"; it's definitely good for tight coronaries. And later on in the day there's always "Tea For Two," especially with a shot of rum in the tea. And with the high cost of living it is pleasant to hear that "The Best Things in Life Are Free," even when you know darn well they aren't. If somebody plays the "Beer Barrel Polka" while we're having a cold bottle, we'll seize Mama and stomp around the kitchen with the best of them, but we have nothing but a cold sneer for "Drink To Me Only With Thine Eyes" stuff, which is definitely for sissies.

To tell the truth, we like the classics with our gastrics. When we're having one or two, or even three, before dinner, it's reassuring to listen to Beethoven's Fifth. And with our three-dollar sirloin, we'll listen to the Toreador's Song from "Carmen." (If you ask us, though, that "Toreadora, don't spit on the floora!" line is pretty rough for nice people's eating.) With a salad of country lettuce, we like something from "Cavalleria Rusticana." Definitely for us is a Polonaise with our mayonnaise, a gavotte with the compote, or "Manon" and our capon.

It should be clear that we can take our music with our digestion and like it . . . most of the time. But we firmly believe that much of the high incidence of stomach trouble that occurs today may be due to the music that we get with our meals, whether we want it or not. Go to the average restaurant for a nice quiet repast and what happens. Some character slips a nickel in the slot and comes out "The Jersey Bounce," just when you're forking in a nice mouthful of steak. What happens to the pylorus then shouldn't be mentioned in a high class discussion such as this one. And worse than that is something about "Bongo Bongo, Take Me Back to The Congo," or such lovely sentiments. The very thought of cannibalism makes us nauseated. Rather than listen to "Cow-Cow Boogie," we'd turn vegetarian. A "southerner" named Phil makes us rush for a pill, and whose stomach wouldn't feel cranky while listening to Frankie. Maybe Petrillo is good for our digestion after all.

RIGHT after we finished reading a book about music and medicine,* we picked up the Journal of the A.M.A. and saw an editorial announcing a new series of medical transcriptions to be called "Music With Your Meals." We've gone into this thing pretty thoroughly and we are prepared to take a firm stand in favor of music in medicine and music with your meals, although a lot of the stuff that pours out of the loudspeaker and the jukebox these days is pretty hard for us to stomach.

Not that we're allergic to music. We like it, especially with our food. With soup nothing is nicer than "Flow Gently, Sweet Afton,"

or perhaps, "Look Down, Look Down, That Lonesome Road." "Fee Itty Fisses" is a trifle rough for the fish course, but we've got the stamina for it. If we get "Mairsey Dotes" with our stew, we might gag momentarily over the prospect of eating horsemeat, but we are quickly reassured by "Little Lambsy Divey." For a nice juicy steak, nothing is more appropriate than "Get Along Little Dogie" or "I'm An Old Cowhand."

The "Bunny Hug" is nice, too, with hassenpfeffer, and what could be better with a bagel or a hot pastrami sandwich than "Bei Mir Bist Du Schoen." "I Cried For You" with liver and onions undoubtedly stimulates the lachrymal with the salivary and gastric glands, and if we get "One Meat Ball" with our spaghetti, or Ravel with the ravioli, we don't mind. "Orchichornya" or "The Volga Boatman" with our salad is definitely *de rigeur,* for we like Russian dressing. And for dessert there's always *Der Bingle* crooning "White Christmas."

*MUSIC AND MEDICINE, edited by Dorothy M. Shullian and Max Schoen. Henry Schuman, Inc., New York.

We can't very well escape the radio with our meals at home as the kids are always waiting for Tom Mix, Superman, Carter and their clan to come on—after you listen to a platter pusher and his commercials for half an hour. But we're game—most of the time. That laugh of the Shadow's on Sunday night does dry up our gastric secretion for an hour or so, but we're about to get an ulcer anyway. And we don't really mind starting "The Morning With Hot Ralston" for we've got a sneaking admiration for anybody who always comes out on top the way Tom Mix always does. Personally, we're usually on the other end of the deal.

AFTER reading the book on music and medicine, we've got an entirely new slant on a lot of things, though. One of them is why oboe players are usually a little screwy; the book explains this, in scientific language. After all, if you spent your life blowing in a little hole and nothing came out but a bad noise, you'd be frustrated too. No wonder so many of them take to reefers, at least with those you can suck smoke through a little hole and get a nice big dream, in technicolor, with women, too, we hear. Maybe that's something we should look into.

There's no doubt about the value of music in hospitals, but we're working out a system of putting it into doctors' offices and we've really got something this time. What is more dreary than the average doctor's waiting room with its pile of old magazines, a few pharmaceutical company advertisements, and old pamphlets from the Physician's Committee?

But just wait, we're going to liven things up with our "MEDI-MUSIK." No longer will the patient stagger into the office, after two hours in the waiting room, a frustrated bundle of emotions and a quivering nervous wreck. No, sir, we're going to provide special waiting room music, with a chance to slip in a commercial every now and then, like: "Ah, there's good news today. Our special tonsillectomy (removal of uvula and stopping postoperative hemorrhage free) has been reduced 20 per cent because of the stock market break." And what's more, we'll have special music according to the specialist who's working. With the patient in a cheerful frame of mind, operations will be faster, recoveries shorter, fees bigger.

In the prostate clinic loudspeakers will lure with a nice modification of the Pepsi Cola song. Remember, "Nickel, Nickel, Nickel. Trickle, Trickle, Trickle." It may be "Trickle, Trickle, Trickle" going in, but it will be "Old Man River" coming out. And for the dermatologist, "Forget That Hive, It's Great to be Alive."

See those long lines marching happily into the gynecologist's office while the loudspeaker repeats, "Cramp, Cramp, Cramp, the Girls Are Marching." In the waiting room of the uniquitous ENT men with their eternal sinuses and pharyngitides, what is more appropriate than "Blow, Gabriel, Blow." And for the eczema sufferers it's comforting to know that "It Ain't No Sin to Take Off Your Skin and Dance Around in Your Bones." The proctologist's theme song could be "Mighty Lak a Rose—tte." And so on; you get the idea.

Our service doesn't stop yet, though, and we really believe this is going to be the most valuable part. Every doctor has patients who don't pay their bills, but keep on coming back. Now we give you a subtle way of putting out a strong hint. When such a one arrives, the secretary merely switches on our special recording of "I'll Be Glad When You're Dead, You Rascal, You," and the patient departs pale and shaking. And of course every surgeon dreads the fair, forty, and very fat customer whose gallstones are hidden beneath a mountain of flesh. For this there is our special. Merely flip the switch and comes out Arthur Godfrey, taking care of things for you with "I Don't Want Her, You Can Have Her, She's Too Fat For Me."

There's no doubt about it. Music in medicine is here to stay.

INTERNATIONAL ASSEMBLY
PUBLIC AUDITORIUM, CLEVELAND, OHIO
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Correspondence Department

To the Editor:

I have read the editorial in your journal on the training and qualification of an internist with considerable interest. While unqualified to judge the merits of his claims as they apply specifically to the American Board of Internal Medicine, I nevertheless feel that some of his remarks apply also to other and similar specialty boards and should, therefore, be answered.

In the first place, it does not seem that "qualification by reputation" is in any way endangered by "qualification by examination"; the latter is as necessary for the qualifying of a specialist to practice his specialty as is the National or State Board examination for qualifying the medical graduate to practice "medicine and surgery."

The requirements for the minimum training necessary for producing a specialist, with the stipulation that this be obtained in institutions recognized by the Council on Medical Education of the A.M.A. appear to safeguard not only the Board but the candidate, who might otherwise waste time in an inappropriate institution in inappropriately planned study. Furthermore, the terms of these requirements are strictly analogous to those which apply to candidates for licensure. That they have in any way "placed diplomates of the specialty boards in a strait jacket" is, to say the least, highly questionable. How could they?

Another very debatable point in this editorial is the statement that the younger and more recently graduated physicians would have a better chance of obtaining diplomas than the older, more experienced, and inferentially more talented oldsters. For years the Board of Pathology has been granting and issuing diplomas *without* examination to outstanding pathologists who have seen fit to apply for them, men who have been "qualified by reputation" only. Practically all such eminent men now hold diplomas from our board and, for that reason, we are now giving up the practice of granting them without examination: any one not hitherto sufficiently interested in having the diploma under these conditions will, from now on, have to pay the nominal penalty for his indifference in the matter, by submitting to examination.

The editorial implies that the examination is merely a single written test, which is not at all the case in the Boards with which I have had personal experience (those of Pathology and Surgery). In both of these the examinations are in part written and theoretical, in part oral and practical.

The author of your editorial may be reminded of Sir Clifford Allbutt's words as he cites them, but having perused them carefully I cannot see that they are particularly applicable to the purposes of the specialty boards, or that Sir Clifford had such boards in mind when he wrote the paragraph quoted. Our specialty boards certainly do not attempt to fetter the natural gifts of their diplomates in any way.

In short, this editorial appears to the writer to take a view of the specialty boards in general which is not only unjustified, but which seems to be based upon preconceived notions that are not strictly in accordance with the facts of the matter, facts with which its author might easily have become acquainted had he been inclined to do a little investigation of specialty boards in general.

N. Chandler Foot, M.D.,
President, American Board of Pathology.

To the Editor:

The present method of designating qualified specialists undoubtedly has many disadvantages. I think that most of us, who are members of Boards concerned with the surgical specialties, well realize that the pendulum has now swung too far to the other side, particularly in those hospitals and